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[The following production appeared in the year 1801, in a pamphlet form, dedicated to Dr. RUSH. It has long been out of print, and frequent application having been made for it, the Editor has obtained permission to insert it in this Journal. The author has added a few notes and remarks. For other papers on the disease of which it treats, by Dr. Mease, the reader is referred to the Medical Repository of New-York, vol. i. p. 566; vol. v. p. 292; Coxe's Medical Museum, vol. iii. p. 201; and vol. ii. pp. 174, 339, of this Journal.]—EDITOR.

ART. I. *Observations on the arguments of the late Professor Rush, in favour of the inflammatory nature of the disease produced by the Bite of a Mad Dog.* By JAMES MEASE, M. D.

IT is a mortifying reflection to the pride of physicians, that notwithstanding the disease produced by the bite of a rabid animal was very early described by medical writers, little progress should have been made toward the discovery of a successful mode of cure. The history of this singular disease has indeed been accurately detailed by the ancients, but the numerous remedies and plans of treatment prescribed by them, are marked by ignorance, superstition and want of success. For a long period preceding the time of Boerhaave, we find little on the complaint, except a collection of vague theories, and unsupported conjectures, repeated from

author to author: that laborious investigator however attempted to give a true theory of the disease, and to establish thereon a successful method of treatment, which it is evident was grounded upon the degree of apparent strength exhibited by the sufferer, and caused him to pronounce the complaint "*summe inflammatorius*." The method of cure was accordingly logically deduced to consist in *copious bleeding*. The pupils devoted to the doctrine of their respected preceptor, calmly acquiesced in the adoption of his theory, and anxious to be the instrument of proving the truth of his system by putting it to the test of experiment, boldly pushed the depleting plan to an astonishing extent. But it was found much easier to theorise, upon diseases in the closet, than to cure them when they actually occurred; and that, however agreeable to the nature of the complaint, the plan of treatment appeared to be, its want of success was full proof of the erroneous principles upon which it was founded. Physicians were still at a loss to determine what substitute to adopt. Every one whose lot it was to be called to a case, followed the treatment which his own reflection pointed out as the most likely to succeed: but every new case was an addition to the former melancholy accounts of the feeble efforts of medicine in the disease. At length, the striking analogy subsisting between tetanus and the disease in question, induced Dr. Rush to apply to the latter, the principles he had adopted and successfully practised in the former; and the investigation finished with a conclusion the reverse of the Leyden professor, viz. that the disease was not founded in vigour, but in relaxation. From a conviction of the truth of this opinion, I supported it in my inaugural essay published in Philadelphia, in May 1792; but since that period, the professor has deserted his first theory, and now concludes that both tetanus and the disease under consideration, depend upon excess of action, and that they are to be cured by debilitating remedies. Though I admire the candour and meritorious example, exhibited in renouncing opinions deemed erroneous; yet the arguments brought

forward have not been sufficiently strong to change my mind, and as I consider it of importance to ascertain truth upon this question, I shall endeavour to examine it with impartiality: if, in the result, it shall be determined that Dr. Rush's present opinions are true, then I will grant that the support I formerly derived from the analogy drawn by the professor himself as existing between the two diseases, will fail of effect; but if, on the contrary, his recent sentiments shall appear to be erroneous, then I will recur to the original ground, and derive all the support which I first expected from its adoption.

The theory at present entertained by Dr. Rush of the disease produced by the bite of a mad dog, is, that it "is a malignant state of fever." His reasons for this opinion are as follow.

"I. The disease in all rabid animals is a fever. This is obvious in dogs, who are mostly subject to it. It is induced in them by the usual causes of fever, such as scanty or putrid aliment, extreme cold, and the sudden action of heat upon their bodies. The animal matters which are rendered morbid by the action of the above causes upon them, are determined to the saliva, in which a change seems to be induced, similar to that which takes place in the perspirable matter of the human species, from the operation of similar causes upon it. This matter, it is well known, is the remote cause of the jail fever and the plague. No wonder the saliva of a dog should produce a disease of the same kind after being vitiated by the same causes, and thereby disposed to produce the same effects."

The causes here stated, are certainly those from which the disease in dogs very commonly proceeds. They are likewise the occasional causes of fever in the human race. I am willing to allow all the weight which could be wished from this argument to prove the truth of the theory respecting the disease, but I may hint by the way, that, considering the frequent spontaneous origin of the disease in dogs, and that a complete assemblage of the symptoms peculiar to the

idiopathic affection, never appears in the human species, without the assistance of the canine virus; a doubt is suggested respecting the propriety of employing the fact of the existence of a fever in dogs labouring under the disease, and of its inadmissibility as a collateral argument in favour of the doctrine advocated, as to the human race.

I am at a loss to conceive with what propriety it is supposed, that the morbid animal matters producing the disease are determined to the salivary glands; or whence arises the necessity of this supposition to the explanation of the of the phenomena of the disease. It is apparently grounded upon the admission of the supposition that the affection of the salivary glands is the original disease, whereas it appears to be merely the result of a general diseased action produced by a cause operating in the first instance upon the system at large. It would indeed be difficult to account for the particular violence with which the throat is affected in this disease, but the same difficulty occurs in tetanus from wounds, and this fact fully shows the total insufficiency of the theory of the elective determination of the morbid matters to the throat, to account for the symptoms. The analogy of the perspirable matter of the plague, it is conceived, is not applicable to the saliva of a rabid animal. In the former disease, a fluid is accumulated, and probably undergoes a putrefactive fermentation which produces a set of symptoms very different from those that result from the canine virus; in the latter, the same causes do not operate, for the saliva, though accumulated, is not retained, but discharged in greater quantities than usual.

2. The second proof adduced of the disease in question being a malignant fever, is, "that it prevails occasionally among dogs at those times in which malignant fevers are epidemic."

When any particular circumstance is adduced as an argument upon any occasion, it necessarily implies the uniform presence of that circumstance, otherwise very little weight will be attached to it. It is acknowledged that the disease

appears only "*occasionally*" during the prevalence of malignant fevers, and this seems to be merely an accidental occurrence, for it sometimes appears among dogs in times of general health, and does not occur upon other occasions during the prevalence of a malignant epidemic. The state of the air producing both diseases must therefore be different. During the war of our revolution, the malignant yellow fever ravaged the West Indies, and yet madness among dogs did not appear until the close of the contest: and Dr. Moseley asserts that it had been a stranger to the Islands for fifty years before the year 1783.* Don Ulloa and Des Portes say that it is equally unknown in South America, and in St. Domingo; and yet both these authors describe very malignant fevers which they witnessed. In the island of Antigua, great heat (one of the usual causes of the disease) exists in common with all the West India islands, and another, viz. a deficiency of water, is known to be peculiarly great, yet we find from Dr. Athill† that the disease is unknown. My own reflection will furnish sufficient proofs to corroborate the facts of the absence of the canine madness during the late prevalence of the American pestilence in Philadelphia. An unusual mortality was indeed observed among the cats in several places previous to the appearance of the yellow fever, but the disease of which they died was not madness.

3. The third argument adduced to prove the existence of fever in dogs labouring under the disease is, "that they exhibit the usual symptoms of fever, such as want of appetite, great heat, a dull fierce red or watery eye, indisposition to motion, sleepiness, delirium, and madness." To this I reply that the question before us, and the one I am anxious to determine, is, not what is the nature of the disease in dogs, but what is the state of the human system produced by the action of the canine virus on it. Granting that the disease in dogs does prove the existence of fever in them; yet I

* On Tropical Diseases, 4th edit. p. 46.

† Parry, Diss. Inaug. Edinb. 1778.

conceive no support can be derived therefrom, in favour of the existence of the same state in the human race; for we well know that the principal symptoms in man are directly the reverse of those that occur when he labours under fever. Of this I have abundant proofs.

4. "A dissection of a dog by Dr. Cooper* that died with this fever, exhibited all the usual marks of inflammation and effusion which take place in common malignant fevers."

It is not said under what circumstances the dog was dissected; if, after running many hours in hot weather and exposed to the persecution of a host of pursuers, the appearances noted are such as might be expected; but they would also appear in any other dog dissected after a similar exertion of body. At any rate, the analogy derived from symptoms in the canine genus occurring during life, or from appearances after death, is not transferable to the human race. We must reason from symptoms as they appear in man.

"II. The disease produced in the human species by the bite of a rabid animal is a malignant fever." This, it is said, appears from the symptoms, and it must be acknowledged that some of those that occur in the disease, likewise appear in febrile affections, but it must also be recollected that the symptoms resulting from the action of the canine virus upon the human system are in many respects common to nervous affections, where no fever is present. It may be asserted with great safety, that the states of the skin, of the pulse, and of the eye, are very different from those which take place in the commencement of a malignant fever, and from which the indications of cure of the proposed treatment, it is expected, would be taken. The pulse is small, quick, irregular, or natural; the skin is cool, the eye clear, lively and piercing, and the face pale and shrunk: the full bounding tense pulse, the burning skin, red eye, and flushed face, which are so characteristic of the malignant fevers of our country, never appear in the supposed fever arising from

* The late Dr. Samuel Cooper, of Philadelphia.

the action of the canine virus on the human system. In nineteen cases out of twenty, moreover, no delirium is present, but death strikes the sufferer in the moment of conversing freely with his friends. It is presumed, that the symptoms of the complaint indicate a state of the system directly the reverse of inflammatory action.

It is further remarked, that "there are cases on record in which there is said to be a total absence of fever. The same thing has been said of the plague. In both cases the supposed absence of fever is the effect of stimulus acting upon the blood-vessels with so much force as to suspend morbid action in them. By abstracting a part of this stimulus a fever is excited which discovers itself in the pulse, and on the skin, and frequently in pains in every part of the body."—To this explanation three objections may be offered. 1. The absence of fever in this disease, so far from being an occasional occurrence, is almost uniformly observed.* *Salvus Diversus* long since observed this fact. The pulse, as already remarked, is either natural, small or irregular, and never hard or tense: the *occasional quickness* evidently arises from the rapid contraction of the arteries occasioned by the violent irritation of the nerves of the heart. Certainly, therefore, the absence of febrile symptoms in almost every case, implies that they are not essential to the disease: and even supposing that the stimulus of the virus may, in some sudden and violent attacks, go beyond the point of fever, yet this cannot be imagined to happen in nearly all the cases recorded; for some of them came on gradually, and would certainly have been accompanied by fever, if it were the na-

* In every case I have consulted, the absence of fever is noted, except two. One was Dr. Lister's patient, *Phil. Trans.* (old abridgement,) vol. iii. in whom a "*violent fever*" came on the fifth day, with a "*very quick pulse*." The same symptom frequently takes place in hysteria. The other was in Master Rowley, as recorded by Dr. Hamilton. In this case, the fulness and tension of the pulse and headach, evidently proceeded from the mercury, with which his system had been gradually and fully impregnated, to the day of his attack, with a preventive view. The blood, like the blood of persons using mercury, was "*somewhat sily*."

ture of the virus to stimulate. But the fact is, that whether the disease makes its appearance in a formidable and sudden manner, so as to leave no doubt as to its nature, or comes on in an insidious way, resembling a common cold, yet a true fever has never appeared. The presence of heat in a single case, or even in two or three, (and more will not be found) cannot prove that it arises from an increased force of the heart and arteries; for the heat of the human body is by no means solely dependent upon the circulation, but on the contrary, is very intimately connected with the state of the nerves. That careful observer, Sydenham, long since noticed the death-like coldness of the body in a fit of hysteria, while the pulse was regular; and we every day see the same thing in women labouring under a disordered state of the nerves, who will be alternately attacked by flushes of heat and by chills, without any sensible change in the pulse. De Haen* gives a similar fact of the extreme coldness of the hands, though the pulse was said to be "*robustum in carpo*." The same author† relates a fact of a part being unusually warm, "*sine sanguinis arteriosi perceptibili transfluxu*."

2. This absence of fever, cannot be said to proceed from the excess of stimulus acting upon the blood-vessels, for, from numerous cases, it appears that the pulse does not increase in frequency or force as in other diseases, (where the same circumstance takes place,) by abstracting part of this supposed excess. On the contrary, the pulse gradually sinks, and alarming symptoms have sometimes followed the first bleeding. In others, no alleviation has been produced by the operation. The pulse did not rise with the *copious blood-letting*, prescribed by Dr. Rutherford,‡ nor after the moderate quantities by any other physician, who has recorded his practice in the disease.

3. The diseases in which this excess of stimulus occurs,

* Ratio medendi, p. 198. Ed. Lond. 1761.

† Ibid, p. 201.

‡ Memoirs Med. Soc. Lond. vol. i.

differ essentially in their modes of attack from that now under consideration. In the former, as the apoplexy, epilepsy, and in some cases of the American pestilence, the sufferer is sometimes arrested before he is aware that the seeds of disease are implanted in his system, and the functions of life are performed with vigour the moment before the electrical stroke from the disease is received;* but that produced by the action of the canine virus, comes on in most cases slowly, and exhibits the gradual diminution of the powers of life, by symptoms highly distressing, and which never occur in inflammatory diseases. The arterial system indeed appears to be no way necessarily affected, either in tetanus or the disease under consideration. In the former, we have the fullest proof of the concentration of the morbid action in the nerves, and of the entire freedom from affection in the blood-vessels.†

2. It is observed further, "that the hydrophobia partakes of the character of a malignant fever in appearing at different intervals from the time in which the infection is received into the body. These intervals are from one day to five or six months."

To this I may reply, that more or less interval must necessarily take place between the application of every cause, and the production of its effect; and the great difference in the intervals of attack from the application of the remote causes in the disease produced by the canine virus, and in

* In a case of violent pneumonia, produced in a negro, by exposure to cold in the night, while thinly clad, I have seen the blood-vessels so paralyzed, or affected, as that very little blood would flow, although I was sure I had cut the veins in the arm. Death took place in six hours after I saw him, and in thirty-six from his attack.

† Dr. Moodie relates that the catamenia appeared at the regular time in a lady ill with the tetanus. Duncan's Med. Comment. vol. iii. This disease and that under consideration, are so nearly allied in their nature and symptoms, that any observation made on one may be applied to the other, and I have no doubt the event just mentioned would also take place in the disease produced by the canine virus, if it should happen to be excited into action a little before the usual return of the discharge.

malignant fevers, may even be urged against the supposed analogy; for the disease has appeared in all the intermediate periods between ten days and nineteen months, after the reception of the bite.*

* Phil. Trans. No. 445.

Dr. Hamilton, vol. i. p. 112, after a very laborious research, fixes the *tenth* day as the earliest period at which the disease has appeared, and nineteen months, as the latest.

Between these periods the times of attack were very various.

Of 131 cases, 17 were seized before the 30th day.

63	between	30 & 59	} days inclusive.
23	from	60 to 90	
9		90 to 120	
2	at	5 months.	
1		5 months and 11 days.	
1		6 mo.	
1		7 mo.	
2		8 mo.	
1	between	8 and 9 months.	
2	at	9 mo.	
1		11 mo.	
1		14 mo.	
2		18 mo.	
1		19 mo.	

[The late Dr. David Ramsay of Charleston, S. C., informed me by letter in 1796, that he was called late to a person who had been so slightly bitten sixteen months before, that the patient and family had entirely forgotten the circumstance till questioned about it.

A boy bitten in a fore-finger, Sept. 15, 1813, remained well until 10th Oct. 1814; when the disease came out, and proved fatal in thirty-four hours. *Med. and Phys. Jour. Lond.* vol. vii. p. 527. Another boy whose case is published by the author, remained free of complaint for three years and four months. *Med. Repos. N. York*, vol. v. p. 98. It may be taken as a fact, that there are no certain principles upon which the time of attack can be predicted after the reception of a bite.—Nov. 1822.]

I believe I first denied the truth of the opinion universally received since Aurelian, that the disease commences its attack sooner or later in proportion to the nearness of the bite to, or its distance from, the head. I find this erroneous position lately delivered as an axiom by Dr. Hunter, (*Trans. of Soc. for promoting Med. and Chirurg. knowledge, London, 1793.*) To the authorities referred to in my inaug. diss., I may add those collected by Dr. Hamilton, (vol. 2d,) which clearly disprove the opinion. Of twenty-nine cases, there are twenty-one of persons attacked from one to four months, of whom twelve were wounded in the cheek, and four in the lip, yet the patients were

"Blood," it is said, "drawn in the hydrophobia, exhibits the same appearances which have been remarked in malignant fevers."

To this I answer, that the appearances exhibited by blood drawn, are so various in the same disease, and depend upon so many causes, that physicians have generally ceased to draw any conclusions respecting the nature of a complaint from them. With respect to the buffy coat, it appears to be formed merely in consequence of the greater fluidity of the blood, whence the lymph suffers the red particles to precipitate before it coagulates. But the assertion that the same appearances are exhibited by the blood drawn in malignant fevers, and in the disease under consideration, appears to be weakly supported. Indeed the almost uniform accounts I met with, of the little appearance of morbid affection in the blood, struck me at an early date of my researches on this disease, and I used the fact upon a former occasion* to prove another point; I merely, however, referred to three cases,† though twenty more were at my hand. In Mr. Bellamy's case related by Dr. Fothergill, the "slight traces of size," must have been accidental. They were probably produced by the circumstances attending blood-letting, which are well known to favour the appearance of the buffy coat. Even granting that this appearance was indicative of inflammation, it must necessarily be supposed to have been moderate, from the remark made on the case; and if any weight will attach to the size on the blood of Mr. Oakely's boy, noticed by Dr. Rush, it must be counterbalanced by the numerous and well attested histories of cases, in which none or very little difference has been discovered in the blood, from that of persons in health. For proofs I must refer to the three authorities already quoted,

not attacked sooner, and in some cases not so soon as others bitten in the hands and legs.

* Inaug. Dissert. 1792. p. 72.

† Phil. Transact. abd. vol. iii. Dr. Lister's case.

Ibid. vol. xlvii. p. 413. Dr. Wilbraham's case.

Morgagni, letter viii. art. 30th.

and to the numerous accounts of cases, in which the fact is fully substantiated.

4. The fourth argument used to prove the disease a malignant fever, is, that it "exactly accords with malignant fevers in its duration. It generally terminates in death, according to its violence, and the habit of the patient, on the first, second, third, fourth, or fifth day, from the time of its attack, and with the same symptoms which attend the last stage of malignant fevers."

To this I reply, that death frequently takes place, in other diseases, in periods equally short, and where no malignancy is suspected, as in the cold fit of an intermittent fever, croup, in apoplexy, and epilepsy. But I deny the accuracy of the statement respecting the similarity of the symptoms in the close of the diseases between which the analogy is asserted. The plague, the hospital or ship typhus gravior, and American yellow fever, all differ essentially in many symptoms. A moment's reflection will show the great dissimilarity between them, and that under consideration. Thus bilious suffusion of the surface, bilious evacuations, violent vomiting, black vomiting, purple eruptions, and spontaneous hemorrhages from the gums, eyes, nose, and alimentary canal, all occur more or less, in the close of malignant, and especially yellow fevers; but never have been known in the disease produced by the canine virus.

5. It is said, "the body, after death from hydrophobia, putrefies with the same rapidity, that it does after death from a malignant fever, in which no depletion has been used."

Putrefaction in the bodies of persons dying of the first mentioned disease, is by no means an universal occurrence. In the modern records of cases it is not mentioned, except in three instances by Morgagni;* two of which occurred in the winter: but to show how little dependence ought to be placed upon the circumstance, I may mention that the body

* Letter viii. Art. 31. 32.

of one of the persons who died in the latter end of July, when the speedy progress of putrefaction ought to have been expected, was the least offensive. But granting the general occurrence of the fact, little weight ought to be attached thereto, for we know that "all animals which die suddenly, and without loss of blood, are disposed to speedy putrefaction. This has long been remarked in animals that have been killed after a *chase*, or by lightning. The poisonous air called *Samiel*, produces, when it destroys life, instant putrefaction. The bodies of men, who die of violent passions, or after strong convulsions, or even after great muscular exertion, putrefy in a few hours after death. Hence the practice of fishermen of breaking the heads of their fish, as soon as they are taken out of the water. The sudden extinction of life in the fish, prevents those convulsive or violent motions which induce sudden disorganization in their bodies. Putrefaction takes place most speedily after death from the yellow fever, where the commotions of the system are not relieved by evacuations."*

Here then we find the same event produced equally, by the affection, or violent excitement of three distinct agents in the human body ; viz. the *muscular*, *nervous*, and *arterial systems*. The explanation I do not pretend to. But the fact satisfies me as to the weakness of the argument in favour of the analogy between the disease under consideration, and malignant fevers.

6. It is asserted that "dissections of bodies which have died of the hydrophobia, exhibit the same appearances which are observed in the bodies of persons who have perished of malignant fevers. These appearances, according to Morgagni and Sauvry, are marks of inflammation in the throat, œsophagus, brain, stomach, liver and bowels. Effusions of water, and congestions of blood in the brain, large quantities of dark coloured or black bile in the gall-bladder and stomach, mortifications in the bowels and bladder, livid

* Rush's Works, vol. iii. p. 74.

spots on the surface of the body, and above all the arteries filled with fluid blood, and the veins nearly empty." To these appearances I may add another, first mentioned by Boerhaave, and lately urged by Dr. Ferriar, viz. "congestions in the lungs."

It is true that a superficial redness has occasionally appeared in the trachea, œsophagus, or stomach; but dissections show that this appearance is much oftener absent than present, and that "it is far different from that kind of inflammation which has been properly called active. It is of the erysipelatous kind, and is always accompanied with marked debility of the system."* If the redness found in the throat was of the kind we meet with in inflammatory angina, or the inflammation of the larynx, we would find it extensively diffused and deep; whereas in this disease, very often no discoloration is perceived, in other cases it is very slight; and where this redness does occur in the throat, it may proceed from the following causes: first, the severe convulsive motions of the muscles producing some slight increased action in the vessels of the part, and by interrupting the regularity of the circulation, cause an *error loci*, and force red blood into serous vessels. Van Swieten gives a similar explanation of the occasional redness found in the throat. He observes, "that it seems rather an effect of the distemper than a productive cause of it; for it is no wonder if these parts become inflamed when they are convulsed at every sight of, or attempt to swallow liquids." This redness is generally proportioned to the duration of the disease and to the violence of the convulsive motions: hence the same author† observes, that in a boy taken off very soon by the disorder, his throat was free from redness, but in a young man who lay longer, some appeared.

2. The marks of supposed inflammation are occasioned by the weakened force of the heart and arteries, and by the consequent irregular determination of the blood throughout

* Hamilton on Hydrophobia, vol. i. p. 85.

† Comment. § 1140.

the body; and third, by the irritation of the nerves of the parts, which by being communicated to the arteries, may increase the rapidity of their contractions, and hence create the superficial redness taken for active inflammation. That the redness is merely on the surface, and very different from the true inflammation of the stomach, we know from a remark made by Dr. Ferriar, who "upon cutting into the muscular coat, found that it appeared quite sound."

We frequently see similar supposed marks of inflammation in those who die of typhus fevers, or some dysenteries, which are known to be accompanied by a deficiency of general action; the proof of which is, that when these diseases are early attended to, and due care is taken to prevent the progress of the general debility by invigorating remedies, these appearances do not occur.

4. This inflammatory appearance may also be occasioned, as Dr. Hamilton hints, by the acrid saliva passing undiluted into the empty stomach; and in Dr. Ferriar's last patient its effects were increased by his intemperate habits.

The congestions of blood in the brain and lungs, upon which so much stress is laid, admit of an easy explanation without having recourse to inflammation. I must first however remark, that this appearance is more frequently absent than present, and therefore cannot be of that importance which is attached to it, especially by Dr. Ferriar. I have already remarked that the nerves of the heart partake of the general irritation pervading the system. This is evinced by the palpitations and the great irregularity of the contractions of that muscle during life, and by the morbid appearances it exhibits after death. The blood will be consequently impeded and retarded in its passage through the lungs, and irregular distribution and congestion must follow.* Hence the paleness of the surface, its painful sensibility to the air, and the sense of suffocation that distresses the patient in this disease. A similar accumulation of blood

* Hamilton, vol. ii. append. xxii.

in the lungs, attended by precisely similar symptoms, takes place in the cold fit of an intermittent, by reason of the determination of the fluids from the surface to the internal parts, arising from the inability of the heart to propel its contents with its usual energy. In the latter case we see these symptoms vanish upon the restoration of regularity to the circulation, by running,* by warmth, or hot drinks, and the same event would likewise happen in the disease under consideration, if it were possible to increase the weakened force of the heart; but the difficulty of exhibiting any medicine prevents the exertions of the physician to overcome the cause, and hence the morbid determinations and the general derangement of both arterial and nervous systems go on increasing, from the commencement to the close of the short, but severe period of the patient's sufferings.

The case of the late Mr. John Hunter affords a striking confirmation of the truth of the pathology I have laid down. It is well known, that for a long time he laboured under an organic affection of his heart, and that he suddenly died, yet the coats of his stomach and intestines were found upon dissection unusually loaded with blood, and the vessels of the pia mater covering the two hemispheres of the brain, were also turgid. Any one who had seen Mr. Hunter's bowels and head, and who was ignorant of the true cause of his death, would have concluded without hesitation that he had died of some violent inflammatory disease, in which no bleeding had been used. Mr. Hunter was affected moreover, during life, with symptoms that occur in the disease produced by the bite of a mad dog, particularly false perceptions, alteration in vision, and increased sensibility of

* From running, patients have been frequently observed to find momentary ease in the disease arising from the bite of a mad dog. This effect must be produced by the temporary restoration of regularity to the circulation as in the intermittent, which relieves the lungs from the blood accumulated in them. And by the way I may remark, with Dr. Hamilton, that this fact adds another proof of the existence of debility in the disease, for in what inflammatory complaint do we see the same relief obtained by exercise: would it not produce death in pneumonia?

the organs of sense, and all occasioned, as Dr. Hamilton justly remarks, by partial and irregular distribution of the blood.

But what shall be said to the "mortifications in the bowels and bladder, and livid spots on the surface of the body?" Do not these show the malignant state of the fluids? I answer, that I am much disposed to doubt the occurrence of these appearances in the actual disease. No modern physician has noticed them in his account of any dissection. Morgagni does not enumerate them in either of the two cases which were dissected for him by his friend Mediavi. He does indeed quote them from ancient authors, but little attention is due to them, for we well know that the mere occurrence of an accidental disgust to water in the delirium of a malignant inflammatory fever, or in mania, was sufficient to mark the disease with the name of "*hydrophobia*." On dissection, the appearances found were attributed to the action of the canine virus, when in reality they were occasioned by very different causes. The mortifications I therefore refer to a febrile cause, and not to the canine virus. The livid marks occasionally seen about the breast and neck, may be readily produced by the obstruction to the blood, from the convulsion of the throat.

The emptiness of the veins, and the fulness of the arteries with fluid blood, upon which so much stress is laid, to prove the malignant nature of the disease, do not occur so uniformly, as to authorize its use as an argument upon the present occasion. The industrious Morgagni* in summing up the various appearances observed by him in the blood-vessels, says, "as to what relates to the blood in general, the arteries of one were very full of blood, and the veins almost empty; in another the vena sine pare was almost empty, but the iliacs greatly distended therewith, and the corresponding arteries empty: the internal jugular veins and carotids were as empty as both arteries and veins with-

* Letter 8. Art. 30. 31.

in the cranium were full. In one the blood was not con-
creted in any part, but the whole was fluid and did not co-
agulate in the open air though cold, but in another, it was
rather concreted than dissolved. Nor indeed have I found
less variety in other dissections published by learned men:
there is one who affirms, that in thirteen bodies the veins
were filled with fluid blood, but that the arteries were
empty." Thus then it appears, that this supposed import-
ant circumstance is not essential to the disease, and conse-
quently no argument can with propriety be drawn from it
to prove the truth of the theory I oppose, nor can it autho-
rize the deduction as to practice which its admission would
lead to. The emptiness of the veins, and fulness of the
arteries, was, moreover, discovered in the late Mr. Hunter,
in whom no previous symptoms of inflammation existed.

It is acknowledged by Dr. Rush that "two cases of death
from hydrophobia are related by Dr. Vaughan, in which no
appearance of disease was discovered by dissection in any
part of the body." The cause is said to be the "violence
of the morbid action, which prevents inflammation."

The absence of morbid appearances in the bodies of
those who die of the disease, is so commonly observed,
that it must be occasioned by a cause intimately connected
with the nature of the complaint. Upon my theory of the
exclusive action of the virus on the *nerves*, a solution is
readily offered. Though death take place merely from the
action of a morbid cause upon them, they do not exhibit
marks of disorganization. Their influence upon our systems,
and the intimate connection between the preservation of
their healthy state, and the regular discharge of all our
functions, is one of the mysteries of our nature. But,

1. I have already shown, that the progress of the symp-
toms is essentially different from those that occur in other
diseases, in which this arrestation of the powers of the
blood-vessels takes place.

2. Where this morbid action occurs, to a great degree,
the blood is dissolved, and it will not recover its usual con-

sistence, much less exhibit an inflammatory buff, until after the second or third bleeding. Every one whose lot has been to attend cases of the American pestilence which has ravaged various towns in the United States, and who has followed the successful practice of Dr. Rush, has seen this occurrence. But do we see any thing in the disease produced by the canine virus to induce a belief, that this intensity of action takes place? Certainly not.—In no case where blood has been taken away to a great extent, has it been observed to be dissolved, nor has the buff afterwards appeared; nay, in the very bodies in which no marks of disease were found after death, the blood previously drawn, has resembled that of healthy persons. It must be understood, that by this general assertion, I allude to those *real cases* of the disease recorded, and resulting unequivocally from the action of the canine virus. To this assertion there is but one *apparent* exception, and that occurred in Master Rowley, whose blood was remarked to be sizy. But this appearance must without doubt be ascribed to the effects of the mercurial stimulus on his blood-vessels, under which he had some time laboured, as a preventive mean. Whenever the appearance of the blood is mentioned in other cases, it is noticed as no way different from that of healthy persons. Of the accuracy of this fact, numberless cases might be quoted.

3. It is natural to expect, that in those cases where the supposed excess of stimulus was in part removed by bleeding, the vessels would act, and produce inflammation, agreeably to the theory delivered before. But in the case* related by Dr. James Johnstone, although sixty-six ounces were taken away, yet no appearances were discovered on dissection, different from what might be found in those who die of asthma. This case of itself, I consider as decisive in its authority.

I apprehend, therefore, that but little support will be derived to the theory of the inflammatory nature of the dis-

* Memoirs Med. Soc. Lond. vol. i. p. 243.

ease in question, from the appearances of the bodies of those who died of it. I early remarked the little light which was to be derived from dissections, and I may again repeat with Morgagni, "that much as the afflicted differ while living, they differ more after their death." Numerous cases since the time of Morgagni, have fully confirmed this truth.

I shall now proceed to examine the validity of the proofs of the inflammatory nature of the disease, derived from the supposed cure of it by depleting remedies.

The first case adduced by Dr. Rush, is that related by Dr. Nugent, who is said to have cured a woman by the loss of 47 ounces of blood, in three bleedings. I agree fully with Dr. Hamilton in thinking that the canine virus had no concern in this case, and ascribe with him to "imagination and apprehension of danger, the chief symptoms which are attributed to hydrophobia." This objection I have in another place,* had occasion to urge, against the admission of Dr. Nugent's as a true case of the disease in question, and I may add further; notwithstanding the patient "suffered great anxiety from the bite, yet she remained perfectly well, until her fears were in some measure rendered probable by the death of a dog bitten by the same animal as herself." After taking a variety of remedies, which from their direct opposition to each other, could have had no share in the temporary abatement of the disease, "she nearly recovered, when the whole of the symptoms were a second time renewed, by the officious interference of a person who told her, that her recovery was *impossible*. At this as might be readily expected she was greatly moved, and instantly thrown into violent hysterics, and no doubt had both a dread of fluids and difficulty of swallowing,—symptoms which this protiform disease has actually put on."†

Mr. Wrightson's supposed case of the disease,‡ was certainly a temporary phrensy. Two reasons offer to support

* Inaug. Dissertation.

† Hamilton on Hyd. 1st Edit. p. 126.

‡ London Med. Trans. vol. ii.

this opinion: first, the symptoms appeared in three days after the bite, which is a period much earlier than has ever been known; and 2dly, the remedies were not carried to that extent which the disease would have required, had it been inflammatory, and actually had proceeded from the canine virus. Twelve ounces of blood only were taken away: now, in a disease said to be the most inflammatory to which the human body is subject, the loss of this quantity of blood could profit nothing. The absurd combination of musk and the two cinnabars was taken internally: thirty drops of laudanum were also given when the patient was first visited, and one grain and a half of opium every three hours after; this remedy appears to have had a sensible effect in abating the spasmodic affections; but, judging from the general inefficacy of that medicine in the real disease, when given in much larger doses, it is evident, we must refer the complaint to another source than the virus. Thus Dr. Vaughan gave fifty-seven grains of opium in the course of fourteen hours; used half an ounce of laudanum by way of injection, and an anodyne plaister to the throat. In the last case, he relates, "opium was given with no sparing hand," to a child eight years old, and yet it is observed, that not even a short relief was obtained. Dr. Wavell* also gave fifty grains in 24 hours, besides opiate clysters, without any benefit: and Dr. Babbington,* apparently determined fairly and fully to try the effects of the remedy, gave 180 grains in twelve hours, without inducing sleep, or producing the smallest alleviation of the spasms.

Mr. Falkner's† treatment of another supposed case of this disease by "*copious* bleeding aided by mercury," is also quoted. The quantity of blood taken away is not mentioned, but it is clear that the mercury was the active remedy; for no abatement of the delirium or other symptoms was perceived, until after the system had been saturated with that mineral by frequent frictions, and by the turpith bolus. After this, it is said, "the disorder became less and less, a

* Med. Records and Researches.

† Med. Trans. vol. ii.

salivation came on, and during the first days of it, the woman recovered her senses perfectly."

The patient cured by M. Poupart by bleeding until fainting, appears to have laboured under a common mania. I find upon reference to the case, that she is stated to have been *enragée*, and that "she was bound to her chair for a whole year, and confined to a diet of bread and water." Now we know that the disease arising from the canine virus never continues so long as a year, and when an alienation of mind is produced, it is but momentary.

Mr. Berger also mentions that several persons were bitten and cured by bleeding, and that two others who were not bled, died. These cases, together with that of Mr. Poupart, are copied by Plenck,* from the Trans. of the Acad. of Sciences of Paris for 1699; but the particulars, which are so essential to the formation of a just opinion of the disease and its treatment, are not given. It is impossible to say positively, whether the cases reported to have been cured were not like those of Dr. Nugent, Mr. Wrightson, and others, no way connected with the canine virus; and in a question of so much importance as the present, no attachment to theory, or to particular modes of practice, ought to lessen our caution in the admission of any facts, except those free from every shadow of objection. I think therefore I am warranted in throwing aside the cases related by Berger as inadmissible. With respect to the bleeding, moreover, I am at a loss to determine whether it was used in these last cases, as a preventive, or to cure the disease. If with the first intention, but weak conclusions can be drawn of its success; for we know from the testimony of Mr. Hunter, Dr. Vaughan, and other authors, that not one of a great many persons who are bitten, are ever attacked by the disease. Nay, Dr. James says he knew a footman who had been bitten by "dogs manifestly mad," at three different times, and who remained well, though no-

* *Bibliothèque choisie de Med.* 12mo. tom. xv. p. 212.

thing was ever done for him.* If the bleeding was used with the latter intention, I will oppose to the weight which the success of the remedy will carry with it, the authority of twenty in which it has failed, for every one which in a recovery has taken place after its use. The recovery of certain persons in the American pestilence or yellow fever, from the use of certain remedies formerly in vogue, might in like manner be supposed to prove their utility, and yet we now see them totally proscribed as injurious ; I need but mention the general use of bark and wine, which have so fortunately given way to mercury and the lancet.

The particulars of the case said to have been cured by Mr. Le Compt in France, "by copious and repeated bleedings," ought to have been stated, in order that an opinion might be formed as to the actual nature of the symptoms removed by him. As they have been kept back, I must suspend my assent to the efficacy of the remedies, until I know that some other complaint was not mistaken for the disease, but that it actually proceeded from the operation of the virus. Nay, even granting the reality of the case, it is very probable the patient owed his recovery to the strength of his constitution, by which he was enabled to withstand the effects of the repeated bleedings prescribed for his cure.

As to Dr. Tilton's patient cured by copious bleeding, I have formerly shown it to have been a case of violent hysteria bordering on mania, a combination we sometimes meet with in practice. I shall not therefore now repeat the arguments in favour of that opinion.

Dr. Innes's patient is the last quoted to prove the utility of blood-letting. In this case a most violent inflammation of the stomach, attended by an equally violent disgust to water, was cured by the loss of 116 ounces of blood. This case has been frequently quoted by authors as an instance of the spontaneous origin of the hydrophobia, and I have already had occasion to notice it on that account, and to assert the

* Treatise on Canine Madness, p. 40, Lond. 1760.

impropriety of calling it by the same name with which the true disease produced by the canine virus is designated. We all know that the inflammation of the stomach is increased by swallowing any thing, and in the definition it is said, as constituting a part of its peculiarity "*ingestis quibuslibet auctus.*" The case described by Dr. Innes therefore, with equal propriety might have been noted for a dread of solids as of fluids; and the reason why the disgust to fluids appeared so strong, was, that the absence of the sensation of hunger, and the great prevalence of thirst induced him to crave only drink, and the pain excited by swallowing it, produced after frequent attempts so powerful an association of ideas, that the same effects followed the mere sight of fluids, as are produced by the attempts to drink in the true disease.

Dr. Rush, aware of the objections which may be offered to the arguments in favour of the inflammatory nature of the disease, derived from the occurrence of a disgust to water in cases where no virus was concerned, as in Tilton's and Innes's patients, observes; "that the morbid actions were exactly the same in both patients with those which are derived from the bite of a rabid animal. There is but one remote cause of disease, and that is stimulus, and it is of no consequence in the disease now under consideration, whether the dread of water be the effect of the saliva of a rabid animal acting upon the fauces, or of a morbid excitement determined to those parts by any other stimulus. The inflammation of the stomach depends upon the same kind of morbid action, whether it be produced by the contagion of the yellow fever, or the usual remote and exciting causes of the gout. An apoplexy is the same disease when it arises from a contusion by external violence, that it is, when it arises spontaneously from the congestion of blood or water in the brain. A dropsy from obstructions in the liver induced by strong drink, does not differ in its proximate cause from the dropsy brought on by the obstructions

in the same viscus which are left by a neglected, or half cured bilious fever."

The first of the above remarks I am under the necessity of denying. The only symptom in which these supposed spontaneous cases of the disease resemble the true disease, consists in the disgust to water. This trifling resemblance ought not to be mentioned as a ground for establishing any principles or analogy; it is merely to be considered as an accidental circumstance coexistent and inseparably connected with the affection of the throat, the occurrence of which is of no importance except as an aggravating circumstance, and which gives rise to no indication in the cure: but it surely cannot be contended that the great difference which we observe in the nature of the various stimuli, does not cause any difference in the nature of the effects produced. In reply to the illustration of the doctrine quoted, I may ask, does the inability of resting, and the difficulty of breathing in ascites and peripneumonia notha, give rise to no difference in the nature of the two diseases, and to the remedies proper for the removal of these symptoms? Is not delirium very differently cured when it proceeds from the atonic state of the brain that occurs in typhus, and when it proceeds from the high tone of the vessels in phrenitis or pneumonia?

Let any one stop here, and seriously reflect whether the answers which will be offered to him upon the proposition of these questions, will not entirely overthrow the position respecting the universal identity of the remote causes of diseases. But if the occurrence in inflammatory complaints of an accidental symptom of the real disease, should finally be received as an admissible argument in favour of its inflammatory nature, I hope I shall be permitted to oppose to its influence the weight of the fact of the occurrence of this supposed important symptom in diseases decidedly depending upon great debility. Thus Mr. La Coste,* the French translator of Dr. Mead's works, relates

* Med. Comment. vol. iv. p. 369.

that he saw a hydrophobia appear in typhus. Schenkius also relates its occurrence in low putrid fevers, and I have long since remarked it as an attending symptom of hysteria and tetanus: but I forbear to derive any advantage from these facts, unless it shall be generally agreed to admit the legality of those they are intended to oppose, and to which I think they are a full counterpoise. It may not be improper here to remark, that the occurrence of the dread of water in typhus, as mentioned by La Coste, was one of the first facts I met with in the commencement of my speculations upon the disease, and I imagined that it afforded a powerful argument in favour of the principle of debility which I had adopted as its cause; but I soon perceived upon reflection that the dread of fluids gave name to the disease, it was merely an accidental attendant thereon; that being an effect of a symptom, viz. the affection of the throat, it gave rise to no indication in the cure, and consequently any argument derived from its occurrence in diseases of acknowledged debility, ought no more to authorize the same mode of treatment in the real disease, than the occurrence of a sore throat in any complaint, should point out the treatment for *angina*, or when it appears as an idiopathic affection. I am as great an enemy as any one to the servile dependence of physicians upon nomenclature, and I sincerely rejoice in the prospect of the speedy termination of its reign; but in the rage for revolutionizing medicine, let us be cautious in drawing conclusions as to the cure of an awful disease, from the prevalence of one of its symptoms in other complaints, which are directly opposed in every circumstance to the one in which the symptom most generally occurs.

Dr. Rush "grants that bleeding has been used in some instances in hydrophobia without effect, but thinks that in all such cases, it was probably used out of time, or in too sparing a manner; and he begs that it may not be tried in this disease, by any physician who has not adopted in their

utmost extent the principles and practice of Botallus and Sydenham in the treatment of malignant fevers."

In answer to this I would observe, that the theory of the inflammatory nature of the disease was very early adopted by physicians, from the apparent vigour exhibited by those labouring under it, and the depleting system was in consequence deemed the only one by which a recovery was to be effected. Boerhaave was so firmly persuaded of this opinion, that he says "bleeding is to be used *non parca manu, sed iterum iterumque repetenda usque ad deliquium animi.*" The advice was enforced by his laborious commentator Van Swieten, and rigidly followed by the pupils of the great systematic. But was the result uniform success? By no means. With one single exception, (and this I shall presently show is not free from suspicions of its not having been the real disease,) death almost constantly followed. As it may tend to carry weight upon this subject, I will just mention one case in which bleeding was used to great extent without success. It is related by Dr. James Johnstone.* The subject, a man grown, began the debilitating plan as a preventive, two days after the reception of the bite, by losing 16 ounces of blood; and when the disease actually commenced, he was bled, and again some hours after was ordered bleeding gradually to the amount of 66 ounces: but though he became sick from the evacuation, and was purged both by medicines and injections, and the plan of treatment was assisted by a total abstinence from food, yet the disease continued to advance until death closed the scene. It is moreover remarked that, though the "pulse was feverish, hard, and the tongue white and dry," the blood exhibited none of those marks which Dr. Rush mentions as appearing in the blood of persons in the disease. "It was not sizy, the serum was abundant, and the crassamentum, though florid, was loose." Dr. Rutherford, who was at that time clinical professor at Edinburgh, in the

* Mem. Med. Soc. Lond. vol. i.

lecture which he gave upon the case, declared his belief of the error of his master Boerhaave, and his firm determination to treat the disease upon principles directly opposed to those by which his practice had been guided. This case made a strong impression on my mind, when I began to consider this subject, and I noticed it in my first publication on the disease.* I still consider it decisive as to the injurious effects of the debilitating plan of treatment, were there no other proofs to assist with their authority.

The person whose case is related by Dr. Ferriar,† had been bled for the cure of a pulmonic complaint, which came on twice between the reception of the bite and the appearance of the disease. The second time it attacked him was immediately before the operation of the virus. It is merely stated that "his complaints were removed the first time by the usual remedies;" it is therefore probable that bleeding was used; the last time it is expressly stated, that "he was *twice* bled;" the disease however proved fatal.

But further, Dr. Hamilton‡ has collected with great industry no less than twenty-two cases of this disease, in which bleeding had been used to *various* degrees and without success. It is true the remedy was not carried to that extent, which its respectable advocate thinks necessary for its success, but it must be recollected that some of the patients were children, in whom the quantity taken away would have produced some effect in all other diseases, however inflammatory, and that the degree of supposed inflammation could not, in the common course of things, have been the same in all the rest; it is therefore granting too much to suppose, that the quantity of blood taken away was not commensurate to the exigencies of some of the various constitutions in which the remedy was tried; and yet we find that in every case not the least alleviation of the symptoms took place, on the contrary, death followed equally certain, as in other

* Amer. Museum, vol. viii. 1790.

† Med. Hist. and Reflect. vol. i.

‡ Remarks on Hydrop. vol. ii. append. p. xx.

cases where no bleeding was used, or where the disease was permitted to run its course;—remaining even to this day a melancholy example of the deficiency of our boasted knowledge in the healing art, in one disease at least.

The only case which can in the least support the doctrine that the disease depends upon excess of action, is that related by Dr. Hartley in the 40th vol. of the Phil. Transactions. In this case, a man was cured of a disease attended with raving, and a dread of water, and which was supposed to have originated from a bite received two months before, by the loss of 120 ounces of blood in seven bleedings. But I think we may fairly suspect that the disease thus said to have been cured did not proceed from the canine virus. For, 1. it lasted during *seven* days, a period longer by three days than the usual duration of the real complaint. 2. The actual madness of the dog was not ascertained. 3. As some of the most distressing symptoms of the actual disease are not noticed, we have a right to conclude they did not appear, such as the weak pulse, the hurried breathing, catching of the breath, and the sense of suffocation upon being exposed to a current of air. 4. The violent vertigo, sudden loss of speech and of memory, and sullen disposition with which he was affected, seldom if ever occur in the real disease. But even granting that this was a case of the true disease, I think the authority attempted to be derived from its use is outweighed by the numerous and well attested cases recorded of the injurious effects of the debilitating plan of cure.

I have now gone through all the arguments adduced by Dr. Rush in support of the opinion that the disease produced by the bite of a mad dog, is a malignant fever. For other arguments in favour of the opinion that it originates from debility, I must refer to my former essay on the disease.

In my inaugural essay, I recommended the use of opium, on the principle of its antispasmodic virtue, but in much larger doses than it had ever been prescribed in the disease, because I perceived that the small quantities which had

always been prescribed, never in the least mitigated the symptoms. But from the examples before stated of its inefficacy, even when given in larger doses than I thought the system could bear, I am now convinced, that it is losing time to trust to it. In its place I would recommend the use of the powdered leaves of Stramonium* or their extract, in doses of two grains for an adult. By that quantity Dr. Cooper† found the pulse "increased in frequency at first, and that it afterwards became full and quick, and produced giddiness, *warm skin*, moist hands, and *sleepiness*." A defect of due energy in the heart, wakefulness, and cold skin are symptoms that constantly attend the disease, and the two last are sources of much distress. Hitherto no remedy has had the least effect in removing them. Their cure will greatly assist toward the removal of the whole complaint. This may be effected in my opinion by the *stramonium* if given *early* in the disease. It should be exhibited in such doses as will *powerfully affect the system*, and repeated as often as a previous dose has ceased to act. During the suspension of the symptoms, bark and wine ought to be given, and the dose gradually increased, so as to keep up a regular excitement and produce a permanent vigour in the system. The quantity of wine may be unlimited. Indeed the only rule that ought to be observed with respect to it, is, to *give it in as large quantities as the stomach will bear, and until it produces the desired effect*. For this disease exhibits a singular instance of the concentration of sensibility in certain parts of the body, and of a great defect of it, nay, almost a total exhaustion of it in another. We see the same thing in tetanus and other diseases. Thus while the eye cannot bear the sight of a looking-glass, or a vivid colour, nor the ear the shutting of a door, nor the skin nor lungs the impression of the air; the stomach is so insensible to the impression of stimuli, that a bottle of wine will not produce

* Thorn-apple, or James Town weed.

† Inaug. Dissert. 1797.

as much effect on the pulse as a few glasses will in times of health. Dr. Currie of Liverpool cured a case of tetanus by 110 bottles of wine, and observes that "ebriety was not produced; it soothed the irritation of the nerves, and comforted the mind, and without increasing the frequency of the pulse, it augmented it in strength."*

In case however the above remedies cannot be obtained or exhibited; I should have no hesitation in trying another plan which has several arguments to authorize the experiment, although at first view it may appear to be attended with danger. It is, *to excite a strangury by means of Cantharides.*

The principle of the animal economy first unfolded by J. Hunter, of one irritation curing another, is daily and amply confirmed in practice, and its application in the present disease seems highly probable. Without referring to the many instances afforded, in illustration, I may adduce one disease which is nearly allied to the present, viz. tetanus. When this is occasioned by the lesion of a nerve from a rusty nail, or other pointed instrument, we find it readily yields to an irritation of the wounded part, raised by scarification and the application of hot turpentine, marine salt, or cantharides; and in the progress of the disease, or when it succeeds the exposure of the body to dews and night air after being heated in summer, an irritation of the salivary glands by mercury as readily proves effectual. A knowledge of these facts, and a conviction of the truth of the principle would have been sufficient to prevent my hesitating to try the plan I propose, but I am now confirmed in my opinion of its

* The defect of sensibility exhibited by persons labouring under some diseases of debility is really astonishing. A delicate young lady of Philadelphia, a few years since, was recovered from the lowest state of a typhus or low fever, by the use of 127 bottles of old Madeira wine, which was first given to her, at her own request, when so weak, that she could scarcely be heard to pronounce the single word "*wine.*" From one table-spoonful she took at last two bottles a day. I have also seen children in the *cholera*, or summer complaint, bear almost incredible doses of stimulants.

utility and perfect safety, in consequence of the cure by its use, of a desperate case of tetanus, by Dr. S. Brown of Lexington, Kentucky.* The patient, a lady, was nearly exhausted by the disease, when her judicious physician gave her the tincture of cantharides, which by exciting a temporary inflammation in the stomach and bowels, and producing a strangury, effected a cure. The most dangerous pleurisies have also been cured by the late Dr. Lieper of Maryland, after the common remedies had failed, by exciting a strangury by means of the same tincture mixed with camphorated spirit of wine;† and when combined with tincture of Peruv. bark, and given with the same view, it has been recommended by experience, in the whooping-cough.‡

The recommendation of the remedy in the disease produced by the bite of a mad dog is not new. Morgagni mentions its general use for the cure of the disease in Germany; his remark is confirmed by a late author.§ A Silesian peasant also, acquired much reputation for the cure of the disease, and on the purchase of his secret by the king of Prussia in 1777, the basis was discovered to be the *meloë proscarabæus et majalis*|| (oil beetle). All the insects of the *meloë* tribe, possess a blistering quality. In a disease which hitherto so generally proved superior to all the efforts of medicine, it is a duty to try every plan which promises the least success. The one I now urge, is supported by a just theory, a close analogy, and if we admit the German authority, I may add, is proved by experience. With respect to the safety of the measure, the bold practice of Dr. Brown leaves no doubt. But we every day see a strangury produced by blisters in fevers, which sometimes continues for three or four days, without any injury following. An irri-

* New-York Med. Repos. vol. iv. p. 337.

† Rush's works, vol. iv. p. 35.

‡ Lettsom's Mem. Lond. dispensary.

§ Diss. de Hyd. Auct. G. Uiberlacher, of Vienna.

|| See C. T. Schwarts de hyd., ejusque specifico *meloë majali*, et *proscarabæo*. Halæ 1783. Tilloch's Phil. Mag. vol. vi.

tation of the neck of the bladder intentionally produced and continued for that period, would be sufficient in my opinion for a cure. The general morbid irritability of the system being subdued, would be followed by a restoration of the powers of swallowing, when tonics might be easily administered; and certainly ought to be given, in regular doses, so as to keep up the excitement. The association of ideas, producing the horror of water, being thus destroyed, the general or partial warm bath may be used to remove the strangury,* if it should continue longer than necessary, and does not yield to the demulcent remedies commonly used with success. If a soreness in the bowels should be troublesome, a mucilaginous and oily diet should be prescribed.

Upon the whole, although I have endeavoured to invalidate the arguments advanced by my respected friend and preceptor, in favour of the inflammatory nature of the disease in question, and though I am firmly convinced at present of the force of my objections; yet I have no hesitation in saying that, if any one well authenticated case be adduced of the success of copious bleeding, I will give it a fair trial, and if I find the practice to succeed, I will reject my present theory. I earnestly recommend the subject to the attention of the American physicians, and request that they will either make trial of the remedies I have advised, or of the depleting plan of Dr. Rush; having reference however to the hints given of the practice of Botallus and Sydenham in the cure of fevers by its use, and to the cases related by Dr. Johnstone and others, of the various quantities of blood taken away, without success.

But reasoning apart, where, I may ask, are the cases of

* I have known a strangury of four days continuance in the close of a fever, when the patient was so reduced, that the necessary quantity of liquid could not be taken during the application of several blisters, yield to the application of warm water poured from a bottle, on the lower part of the belly, as the patient lay in bed.

the disease recorded that have been cured by bleeding? I may probably be told of that sent to Dr. Rush, from "Bent Creek, Virginia," by some person under the name of "Robert Burton," in 1803, and published in vol. 2d, Hexade 2d, of the Med. Repos. New-York, in 1806. But there is very great reason to doubt whether such a case ever occurred, or that any physician by the name of Robert Burton existed.

The narrative, moreover, carries internal evidence of its fabrication; and it is a singular fact, that having been republished in the English periodical journals, Dr. Hall, then of Clement's Inn, and the writer of this, were employed nearly about the same time in showing that the symptoms, as related, had no connection with the virus of a rabid animal. The reader is referred to Coxe's Med. Museum, vol. 3d, for the history of the case, and the remarks of Dr. Hall and myself on it.

The cases related by the late Dr. Schoolbred, and by Mr. Tymon, both of Calcutta, may also be mentioned. But having said all that occurred to me, on those cases, in the Med. Recorder, vol. 2d, I shall add no more at present, except, that even without referring to the arguments in favour of the doubtful nature of those cases, and tending to weaken their authority, and that of blood-letting as a sole remedy, it may be repeated that Dr. S. declared he *never succeeded a second time in curing the disease by that remedy!* This is a strong fact, requiring no medical science to see its force.

As I have no other object in view, by continuing my attention to this disease, than to disseminate truth respecting it, and thus to lead to its cure, I will refer once more to the case of "successful treatment" by bleeding, related by R. Wynne, of Shrewsbury, in England, in the year 1812. The subject was a man aged thirty-eight years, and the symptoms appeared fourteen days after the bite, viz. on Friday, February 5, 1813. On the Monday following, in the afternoon, "twenty ounces of blood were taken away in the course of six minutes: fainting took place, and the man remained for one hour with scarcely a perceptible pulse." After the faintness had subsided, the pulse was reduced to

fifty-five beats in a minute. An immediate cessation of the symptoms took place, but returned the next morning, with a "pulse at eighty, full and unequal." Ten ounces more of blood were then taken, and fainting again followed, with immediate alleviation of the symptoms, and a reduction of pulse as before. "For half an hour it was scarcely to be felt, and during the remainder of his illness, it did not exceed sixty. In neither instance of bleeding was the blood buffy. Mercury was also taken, and the mouth kept sore for three weeks."

Let it be supposed then, that this case was unequivocally cured by copious and early bleeding, still there must be opposed to it those related by Mr. Haynes, Mr. Marshall, and Mr. Bellingham, in all of which the disease proved fatal, though treated precisely in the same manner. In those recorded by Dr. Physick, Mr. Ballingall, Dr. Albers, and Dr. Parry,* although actual fainting did not take place, yet the quantity of blood taken away by their direction was so great, and so early in the disease, that it is not too much to believe that, in some of them, the sthenic excitement, if any existed, ought to have been subdued, and the disease cured. They all, however, proved fatal. In the case related by Mr. Wynne, the cure must be ascribed to the manner in which the blood was taken away, rather than to the quantity; and Mr. Wynne, with Dr. Schoolbred, very properly dwells upon the absolute necessity of the *production of fainting* by the speedy abstraction of it: and Mr. Wynne notices the case by Mr. Ballingall, who failed in the cure of his patient, notwithstanding he took away forty ounces from a large orifice, but without producing actual deliquium. Those, therefore, who determine to try the powers of bleeding should attend to these hints. If a spring lancet be used, a vein in each arm should be opened at the same time, to ensure a speedy loss of blood. The operation should also be performed at as early a stage of the disease as possible: but the success of Mr. Wynne, who did not bleed, for the first time, until the

* See the Medical Recorder, vol. ii. p. 343, for an outline of the treatment of these cases.

afternoon of Monday after the preceding Friday, (the day of the attack,) would embolden us to hope that the action of the system, when it does occur, is not always so short as we have been led to believe. The pulse must determine the propriety of performing or of omitting the operation. I should not object to the trial of copious bleeding, notwithstanding the refutation of the arguments in favour of it, derived from the imaginary resemblance of the disease to a malignant fever, and the cure of several recorded cases of supposed real infection mentioned by Dr. Rush, because no cure of it has ever yet been effected in the United States, and the success of one case in England, by bleeding, would warrant a repetition of the experiment. My confidence, however, in the inflammation of the surface over the spine, by the solution of common caustic, in the mode recommended in the Medical Recorder,* increases upon reflection, and I will certainly try it in the first case to which I am called. I again urge its consideration to my brethren.

I regret to be obliged to say that the tincture of cantharides has been several times since tried in tetanus, without success. Some of these are recorded, and others have been communicated to me. Still it may be given, where other remedies fail. Neither the stimulant plan nor the stramonium have been tried, as far as I can learn.

ART. II. *Observations on Artificial Pupil, and the modes of operating for its cure.* By GEORGE FRICK, M. D. of Baltimore.†

A VERY frequent cause of blindness is that obliteration of the pupil which results from severe inflammation of the

* Vol. ii. p. 351.

† It is necessary to premise that the following observations were written before the author had any knowledge of the valuable works of Mr. Guthrie and Sir William Adams on the same topic; but as these have necessarily been confined to a very limited class of readers on this side of the Atlantic,

iris; and there are few operations which the surgeon is called upon to perform, which require more dexterity and neatness in execution than that necessary to remedy such a defect.

Cheselden is reputed to have been the first who divided the iris, for the purpose of forming an artificial pupil; and it was this operation which Voltaire so highly extolled in his *Elémens de Physique*. His method, described in the *Philosophical Transactions*,* and by Morand,† a French surgeon, was the following. He introduced, through the sclerotic, at the distance of about one line and an half from the cornea, a couching needle, sharp on one side only, as if to depress an opaque crystalline. When the point of the instrument reached the internal side of the posterior chamber, he thrust it from behind forward through the iris, dividing this membrane transversely from the internal to the external angle of the eye. If the affection was not accompanied with cataract, he pierced the iris through the middle. Where it was complicated with cataract, he made his incision through the superior part of this membrane, lest the opaque lens might obstruct the rays of light in their passage to the retina.

This operation has been repeated several times since the days of Cheselden, but seldom with much success. Janin‡ attempted it twice, but found the wound to close again, as soon as the inflammatory symptoms had subsided. Sharp,§ who was the first to imitate the practice of Cheselden, met with the same result. "I once performed it with tolerable success, and, a few months afterwards, the very orifice I had made contracted, and brought on blindness again." He employed the same needle that Cheselden had done, but intro-

he flatters himself that his remarks may prove still novel and interesting to the generality of the profession.

* Vol. xxxv. p. 402.

† *Memoires de l'Academie de Chirurgie*, vol. vii. p. 182.

‡ *Memoires sur l'Oeil*, p. 182.

§ *Operations of Surgery*, p. 167.

duced it into the anterior chamber, the more effectually to regulate its movement. In this operation he necessarily penetrated the crystalline lens and its capsule.

Janin having failed in his first efforts to perform an artificial pupil, and observing accidentally, in extracting a cataract, that the vertical section he made of the iris did not heal as the transverse, was induced to attempt the operation by practising a perpendicular section. His success in this new method fully equalled his expectations, and was quite complete in four cases, which he narrates. Several succeeding oculists have imitated the practice of Janin; but the result would scarcely justify the strong encomiums bestowed by its inventor.

This operation of Cheselden has now but few advocates, both in England and upon the continent; and these are to be found only among those who contend for the circular and radial fibres of the iris. Maunoir, of Geneva, is among the number: and in his work *Sur l'Organization de l'Iris et l'Operation de la Pupille Artificielle*, has entered into a very elaborate disquisition of this doctrine.* From the general want of success which attended the practice of this operation upon the continent, the French, and afterwards the Germans, were much disposed to doubt the veracity of the English surgeon; but the difference in the result may be

* A translation of these memoirs may be found, by Mr. Young, in the seventeenth volume of the Medical and Physical Journal. M. Maunoir supposes, contrary to the opinion of the first anatomists, the iris to be composed of two sets of fibres, essentially muscular, and forming two distinct bundles. The one, composed of nearly parallel fibres, extends, as radii of a circle, from the large circumference to the less circle of the iris—the other, commencing where the first terminates, continues to the pupil; the fibres forming a number of concentric circles, which make out what is termed the *circulus minor*. To the first fasciculus he gives the name of *musculus dilatator*, and to the second *musculus contractor*. Professor Maunoir practised his operation with a scissors, peculiarly constructed for the purpose. The one of the blades, which was to enter the iris, was very sharp at the point; the other, which was somewhat longer, and intended to pass between the iris and cornea, was blunt, and furnished at the end with a small button or knob, to prevent its becoming entangled with either of these coats.

easily accounted for from the different circumstances of the cases operated upon. Indeed we know of but one condition of the iris, in which we could look for a favourable result from this mode of operating, viz. where this membrane appears stretched and tense across the eye; and such may have been the precise circumstances under which Cheselden operated.

Professor Schmidt* has given to the operation first described the name of *Coretotomia*, to distinguish it from two others we are now to notice. The former signifies a simple incision of the iris *without* loss of substance; the second, or *Coretonectomia*, an incision of the iris *with* loss of substance; the third, *Coretodialysis*, the separation, or tearing asunder of this membrane from the ciliary ligament.

Wenzel, Senr.† was the first to propose and put into execution the practice of *cutting out* a portion of the iris, to remedy the inconvenience which had so often resulted from the closure of the wound according to Janin's method. He commenced by making an incision through the cornea, with the cataract knife, as if to extract the lens; but when the point of his instrument reached about half a line from the centre of the iris, he plunged it through this membrane, and brought it out again about the distance of three quarters of a line from its entrance. In this manner he completed, with a single sweep of his knife, two semilunar incisions; the one of the cornea, the other of the iris. A small scissors were then introduced under the cornea, and the divided portion of iris cut away.

Guerin has in several instances succeeded, by modifying a little the process of Wenzel. Having finished the section of the cornea, he made a crucial incision of the iris, and then removed the four angles of the cross with a pair of scissors.

Although the two methods here described seem to re-

* Ophthalmologische Bibliothek. Band II. St. 1.

† Traité sur la Cataracte.

move entirely the objection made to Cheselden's operation, they are attended with disadvantages of a still more serious nature. Not to mention the extreme difficulty of the operation itself, it is always accompanied with great irritation and inflammation, and may even cause the entire destruction of the organ.

Mr. Gibson of Manchester* has recommended a different mode of excising a part of the iris. The first step of this operation consists in securing the eyelids as in the operation for extracting the cataract. "A puncture is then to be made in the cornea, with a broad cornea knife, within a line of the sclerotic, to the extent of about three lines. All pressure is now to be removed from the eyeball, and the cornea knife gently withdrawn. The consequence of this is, that a portion of the aqueous humour escapes, and the iris falls into contact with the opening in the cornea, and closes it like a valve. A slight pressure must now be made on the superior and nasal part of the eyeball, with the fore and middle finger of the left hand, till at length, by an occasional and gentle increase of the pressure, or by varying its direction, the iris gradually protrudes, so as to present a bag of the size of a large pin's head. This protruded portion must be cut off with a pair of fine curved scissors, and all pressure at the same time removed; the iris will then recede within the eye, and the portion which has been removed will leave an artificial pupil more or less circular." Perhaps the preferable mode of performing coretomy is that practised by Professor Beer.† Having made an incision of the cornea about a line in length, and as near to the sclerotica as possible, the iris, if it is no way adherent to the cornea, will be protruded between the lips of the wound; of which the surgeon immediately avails himself, by laying hold of the prolapsed part, with a small cataract hook, and cutting it off as close as possible with a pair of Daviel's scissors. The re-

* Practical Observations on the formation of Artificial Pupil. 1811.

† Lehrbuch von den Augenkrankheiten, &c. Wien, 1817.

mainder of the iris immediately shrinks back, and a well shaped pupil is evident. If the iris however adhere in any part of its border with the cornea, the operator is to introduce a small hook, in such a manner as neither to wound the iris nor the cornea, and endeavour to seize the pupillary edge of the iris ; and drawing it out, cuts it off, as before directed. Lastly, where the iris is connected with the cornea, at the spot where the pupil is to be formed, the larger circle of this membrane should be seized by means of a hook, or if this tears out, by a fine pointed and indented forceps, and the iris, thus torn, is to be drawn out, if possible, and cut away. Sometimes, it is even necessary to introduce the scissors within the incision, to cut away the part which has been seized by the forceps, to prevent the too extensive laceration of the iris

Although the facility with which the iris may be torn from its attachments with the ciliary ligament, was noticed and observed by many surgeons of the last century,* the practice of *coretodialysis*, was not introduced until the year 1802 ; when it was first made known by Dr. A. Schmidt in Germany, and by Scarpa about the same time in Italy. We are at a loss to which of these gentlemen to ascribe the priority, as both have obtained the merit of its first discovery. Assalini affirms to have practised this operation as early as 1787, at Reggio, and Buzzi, an oculist of Milan, but one year later ; but neither of these gentlemen made their practice generally known until many years after the works of Schmidt and Scarpa had made their appearance.

Various modes have been recommended and adopted for

* Sharp, speaking of Cheselden's operation, says, "in doing this operation, the patient must be placed as for couching, and the eye kept open and fixed by a speculum; which is absolutely necessary here, for the very reason I would discard it in the other, since the flaccidity of the membrane from the issue of the aqueous humour, would take away its proper resistance to the knife, and make it, instead of being cut through, *tear from the ligamentum ciliare.*" Vid. p. 166. V. I.

Guerin remarks, "*the iris is very easily separated from the ciliary ligament ; a circumstance never to be lost sight of in operating for cataract,*" &c.

performing this operation, but we shall notice the most important only. Scarpa's is after the following manner: The patient being seated and secured as for the operation of cataract, a couching needle not quite so large as that in common use is made to pierce the sclerotica, about two lines from its union with the cornea. When the point has reached the upper and internal part of the border of the iris, it is thrust into this membrane, at a small distance from the ciliary ligament, until it is just perceptible in the anterior chamber. This step of the operation requires attention, as this part of the chamber is very narrow, and the instrument may become entangled in the cornea, which lies close upon the iris. The surgeon is then to press with the needle, the iris from above downwards, and from the internal towards the external angle of the eye, so as to detach a portion of its border from the ciliary ligament. When this is obtained, the point of the instrument must be depressed, so as to rest upon the inferior angle of the wound, which may be rendered as large as necessary by drawing the iris towards the temple. If the pupil then be found clear, the needle is withdrawn; but should there remain any portion of the opaque lens or its capsule obstructing the orifice, it is to be broken down, and brought into the anterior chamber for absorption.

Scarpa,* from the late edition of his work, appears to have relinquished this mode of operating, having found by experience "that the newly formed *oval* pupil becomes in process of time *filiform*, and consequently useless." After noticing the various modes practised by Donegana, Flajani, Adams, Gibson, Beer, and others, he seems disposed to prefer the method of Maunoir.

Schmidt,† instead of piercing the sclerotica in the manner of Scarpa, and entering the iris from behind, made a section of the cornea, with a lancet-shaped knife, opposite that where he intended his artificial pupil; and introducing

* Trattato delle principali malattie degli occhi. Pavia, 1817.

† Ophthalmologische Bibliothek. Band II. St. 1.

a small hook or pair of forceps, seized upon the iris near its ciliary border and tore it from its attachments. It is proper to remark, however, that he practised this mode only when the cornea was quite transparent and healthy; in other cases his operation was little different from that of Scarpa, excepting that his needle was slightly curved at the point, the better to enable him to seize upon the iris.

Assalini,* after noticing the successive improvements this operation has undergone, suggests another of his own, not entirely unexceptionable. Having made a section of the cornea, he introduces a species of forceps, the one extremity of which being pointed, is easily made to pierce the iris. The apices of this instrument are dentated, so as to close most accurately, so that having laid hold of the iris, he was able to detach it with the greatest facility from the ciliary ligament.

Professor Beer has now in a great measure abandoned the practice of coretodyalysis detailed in his work, and adopted that recommended by Reissinger—which consists in strangulating the iris with a double-hooked forceps, between the edges of the cornea.† The operation must be begun near the outer edge of the cornea, and, if possible, three lines distant from that part of the iris which is to be separated. The incision of the cornea is best made by the lancet-shaped knife, and should never exceed two lines in length, or the prolapsed part cannot be sufficiently strangulated. The double-hooked forceps, closed, is now introduced through the opening of the cornea, carried forwards in a parallel direction to the iris, and with the points downwards, till it reaches as near as possible the ciliary edge of the iris. The forceps are now to be turned, that the points of the hooks may be directed towards the iris; and the blades, slightly opened, are sunk into the iris. The surgeon now closes the forceps again, at the same time that he draws them towards the

* *Ricerche sulle pupille artificiali.* Milan, 1811.

† *Darstellung eines neuen Verfahrens, die Mastdarmfistel zu unterbinden, u. einer leichten u. sicheren Methode künstliche Pupillen zu bilden,* Augsburg, 1816.

opening of the cornea—and by these motions gently and easily disengages the iris. In this manner, a considerable part of this membrane will be separated, which is brought through the wound of the cornea, and left to unite with the cicatrix, producing thus a species of prolapsus iridis. Where the iris shows any disposition to retract, and the first or second effort is not sufficient to retain it between the edges of the wound, it will be proper to cut off the part of the iris which has been separated, thus uniting coretodialysis with coretotoomia.

The instruments of Langenbeck, Græfe, Emden, Wagner, &c. are little more than modifications of that of Reisinger. Emden* asks whether so delicate an operation should be undertaken through the cornea or sclerotica. He thinks the danger arising from the latter mode has been much overrated, and suggests the question, whether the improvements made in operating *per corneam* cannot be transferred to the operation *per scleroticam*. After a number of experiments, performed with this view on the eyes of brute animals, he invented for this purpose what he terms his *Raphiankistron*.

It is hardly necessary to state, that in all cases where it is practicable, the pupil should be made on the side near the nose; because less squinting is occasioned, when performed in this direction, than in any other. In some instances, however, where the cornea is opaque in this half, no choice is left us, and we are compelled to practise the operation upon the upper or external part.

Assalini, in his pamphlet already quoted, recommends the separation of the iris from the ciliary ligament to be made in the parts situated between the insertions of the recti muscles, thinking it done with greater facility, on account of the smaller number of vessels. Another very material advantage is gained by this method; as the hæmorrhagy in many cases is so great, from the rupture of these vessels, as to cause no small degree of embarrassment and difficulty to

* De Raphiankistro, novo instrumento ad coromorphoseos methodum perficiendum, &c. 1818.

the most dexterous operator. The bottom of the eye, which, in the first moments of the operation, was seen black and shining, is soon obscured by the numberless streams of blood issuing from the torn mouths of the arteries and veins; and, in a very little time, the whole of the anterior and posterior chambers of the eye are filled with blood, so that no part of the iris is any longer discernible. Hence the necessity of operating quickly, as, under these circumstances, the operation can seldom be completed. The bleeding never continues long, and the surgeon has nothing to fear, as after a few days' confinement the blood is all absorbed; but it is not until some weeks have elapsed that he can judge of the full success of his operation.

A sound part of the iris should always be selected in preference to one apparently unhealthy.

No attempt should be made to restore the vision where the *larger* circle of the iris has suffered so much from previous disease, that its structure and colour have completely changed: the same objection, however, is not applicable to those cases, in which the *less* circle only is diseased. In the former case, the fibres of the iris generally project more towards the cornea, or sink deeper towards the lens; and the part of the sclerotica which immediately encircles the cornea, puts on a dirty grey or bluish appearance.

The operation should never be undertaken in that state of the iris, which was known to the older oculists under the name of Synesis, or Phthisis Pupillæ, and depending upon a loss of the vitreous humour; as the blindness, in these cases, is not owing to the closure of the pupil, but to the diseased state of the inner membranes. It is alike contraindicated, where there exists at the same time with the deranged state of the iris, disease of the ciliary body, vitreous humour, or retina, varicosity, or general atrophy of the eyeball.

It is absolutely necessary for the success of the operation, that the patient be enabled to distinguish light from darkness. If the eye remain alike unaffected and insensible, when

exposed to the glare of the sun, or confined in a dark chamber, it is most probable, that the same inflammation which has closed the pupil, has extended to the retina and choroid. Under these circumstances, it is evident, that no operation can be attended with success. The patient often flatters himself, that his case is not altogether hopeless, from his experiencing, at times, scintillation or flashes of light of different colours in the eye; but this is nothing more than the diseased sensation, which all amaurotic patients experience; and the prognosis, under these circumstances, is only rendered worse.

An artificial pupil should never be attempted, where the one eye is perfectly sound: for, as the newly formed pupil is without the axis of vision, the person will be liable to squint. Besides, the *power* of both eyes being different, the vision will be rendered more confused and indistinct.

The eye must be possessed of its natural size and tension; the sclerotica and conjunctiva perfectly healthy, and without any varicose disposition of vessels: should the eye, on examination, prove flaccid and soft to the feel, the surgeon may rest assured, there is atrophy of the organ, and any operation, under these circumstances, must prove utterly destructive.

The result of this operation is always very doubtful, where there is extensive leucoma of the cornea, or partial staphyloma of this coat; or where there is a predisposition in the system to gout, rheumatism, scrophula, &c.

“Many reasons have been assigned for the frequent failure of the operation for artificial pupil, but the chief cause has probably been overlooked. According to my view of the matter, disappointment has arisen chiefly, from our not having adopted the most appropriate operation to each particular case: nothing can tend to counteract our endeavours more completely than a prepossession in favour of any one mode of operation, or an adherence to the rules laid down by any writer, however high his reputation.”*

* Doctor Ryan, Dublin Hospital Reports and Communications in Medicine. Vol. II.

The conditions of the eye, requiring this operation, are so various, that no general rules can be laid down applicable to all cases, and much must be left to the judgment and discrimination of the surgeon in adapting his operation to the particular circumstances of each case.

Corectomie, or the cutting out a portion of the iris, is more particularly indicated, where the lens and its capsule are perfectly sound. Such instances are by no means rare; and most generally succeed to inflammation of the external coats of the organ, causing ulcers of the cornea. If so small a portion of the cornea, however, remain transparent, that there is risk of endangering this, by the necessary incision to introduce the hook, it will be better to resort to coreto-dialysis, although the vision from this operation is naturally less perfect. The most favourable cases for excision, are those where the opacity is confined to the central part of the cornea, the circumference remaining perfectly sound and transparent. Professor Himly* attempted, in these cases, to excite a permanent dilatation of the pupil, by the application of hyoscyamus; but finding this to fail in its effect, when long continued, notwithstanding what has been asserted to the contrary, by Adams, Hill, Saunders, and others, he was led to a new mode of performing artificial pupil. Having observed in a case of this kind, that, by a prolapsus of the iris, the pupil was so drawn from its natural and healthy position as to permit the rays of light to pass through it, from the still transparent circumference of the cornea, he attempted to imitate by art, what had here been wrought by accident, and by the formation of a prolapsus iridis, to create a new pupil. His success, in the several instances in which he practised this operation, was most complete, nor was it followed by any great degree of inflammation of the iris, nor in any case by the opacity of the lens or cornea.

In addition to the leucoma or opacity of the cornea, the iris may be slightly adherent to this tunic. It will be suffi-

* Bibliothek für Ophthalmologie, &c. 1 Band, 1 Steuk. p. 175.

cient in these cases, to divide its fibres with the small cataract or iris knife, when they will be found to retract, and leave a sufficiently large pupil; or, the free border of the pupil may be drawn out by means of a forceps, through an incision of the cornea, and removed with the curved scissors in the manner directed by Mr. Travers.

Coretomy is further indicated in that species of *occlusio pupillæ*, which is caused by inflammation of the iris, after the extraction of cataract, provided the effused lymph in the posterior chamber does not extend beyond the less circle of the iris, or there is no opacity of the remaining lens or capsule. The former may be ascertained from the natural form and colour of the larger circle; the latter, from the very imperfect vision of the patient with regard to the various gradations of light.

When this effused lymph has extended to the larger circle of the iris, we must substitute the *coretodialysis*. The same operation is to be practised, when the closed pupil has resulted from iritis, and the lens is still present. There is commonly, in this case, adhesion of the iris with the capsule. Professor Himly advises that the lens be depressed previous to the operation of artificial pupil: but this is in general unnecessary; as the lens is brought from its natural situation towards the external angle of the eye, by the very manœuvre used with the forceps to disengage the iris; or it is so small, as not to extend to the larger border of the iris, so that it can seldom obstruct the new pupil. The only cases, perhaps, which could justify the method of Himly, would be those where the iris lies so close upon the cornea as to render it impossible to disengage the former, without entangling the latter in the point of our needle. By depressing the lens, previously, the iris will be found in a few weeks to have considerably sunk; and the operation rendered comparatively easy.

Lastly, *coretodialysis* is always indicated, where the cornea is so marked, with cicatrices, or is incurably opaque to such an extent, that a sufficient opening cannot be made into it, to undertake the operation of excision.

ART. III. *On Cholera Infantum.* Communicated by
E. HOWELL, M. D. of Philadelphia.

THROUGHOUT these United States there prevails, during the heats of summer, a disease, which has been most commonly designated amongst us as a Cholera Infantum, or the vomiting and purging of children. Of all the disorders with which childhood becomes afflicted in its earlier stages, this is, at least amongst the infantile population of our cities, the most destructive ; its march is rapid, and traces of its severe inflictions and widely spread desolations are annually apparent. This scourge makes its appearance sooner or later according to the season and section of country in which it is found ; with us it seldom shows itself before the middle of June or the commencement of our summer heats, and continues throughout the summer months, occasionally not ceasing its ravages before the cooler days of autumn or the season of frost ; but ere this, its violence is much spent, and it falls more readily within the power of our remedies. Its frequency and danger are always proportionate to the heat of the weather ; affecting children from the second week after birth until their second year, but is particularly fatal during the second summer ; so much so, that this period has become proverbial amongst mothers as a season fraught with danger to their infants.

Symptoms.—Cholera Infantum is sometimes ushered in by a diarrhœa, which shall continue for several days without any other symptom of indisposition, but more commonly makes its onset in a rapid and sudden manner ; the child, immediately before in the apparent enjoyment of full and vigorous health, shall at once be seized with a vomiting and purging, to the surprise and alarm of its attendants. The matters discharged consist chiefly of highly offensive and highly coloured fluids, being little more than an increased secretion of the intestinal mucus, sometimes mixed with a

dark or yellow bile, but the latter is by no means proportionate in quantity ; in others the stools from the first are bilious, but soon lay this aside, to assume their usual and characteristic appearances ; are frequent, amounting to 15 or more within the 24 hours, attended with gripings, &c. and in the severe cases occasionally accompanied with cramps of the abdominal and other muscles, and sooner or later becoming bloody—an urgent symptom.

The vomiting, in the majority of cases, is not pressing, at least not after the first 24 hours, and in some is absent throughout the whole course of the complaint ; epigastrium more or less tumid, with tenderness on pressure ; tongue (in its phasis is very various, though generally) white ; thirst intense, during the exacerbation refusing to be satisfied. The surface soon loses the softness and fulness of health ; the skin becomes dry, harsh, and from the rapid emaciation much shrunk, particularly on the inside of the thighs, and varies much in its temperature ; for while the extremities from the first have been cold or of their healthy temperature, the head and abdomen are preternaturally hot. Pulse small and quick, though sometimes full. As in most febrile movements of children, there is an evident exacerbation, most generally towards evening. Countenance pale, wan and languid, eyes sunk and dull, with great insensibility of the surface ; the child moans and sighs much ; enjoys but little sleep ; is excessively irritable, sometimes attempting to bite its nurse, or rolling about its head, or constantly putting up its hands to its face ; now indeed the various symptoms of cerebral irritation more or less rapidly intervene. Although a remission of the urgent symptoms of the original complaint may take place on the supervention of encephalic disturbance, yet the latter is too often only designative of mischief going on in the region of the liver ; for though in those constitutionally predisposed to hydrocephalus or other affections of the *cerebrum*, &c. such might ensue, and thus terminate the original complaint, yet more generally the affection of the encephalon suddenly ceasing, the hepatic derangements

have become established : thus we cannot be too much on our guard, particularly if the right hypochondrium becomes tumid or painful on pressure.

Many of the numerous victims to this endemic are exposed to hardships inseparable from their condition : they suffer from a scanty and meagre diet, illy adapted for aliment or to give tone and vigour to the system ; from inattention to cleanliness, &c. and all suffer from the excessive heats of the summer, combined with sudden aërial vicissitudes, or with exposure to a moist and vitiated atmosphere. Infancy is, however, the season of sickness ; the various modes of vital action, not as yet strengthened and confirmed by habit, become susceptible of rapid changes from otherwise slight causes. The digestive system in particular, from having an excessive function to perform in building up the corporeal frame, is liable to frequent derangement, particularly during the development of the primordial teeth ;—a process which marks an important era in the infantile state, and too often becomes the source of much general as well as local irritation, (determined according to constitutional predisposition, and sometimes to the brain, but more commonly engendering morbid affections of the digestive apparatus.) Hence some have been disposed to consider dentition as the most probable source of this complaint. But its presence before the commencement of this process, its absence under all the consequences of dental irritation, its occurrence at stated periods, is decisive of the question. Yet in children labouring under the irritation of dentition this disease must be more readily brought about, and more children, it is supposed, die at this period than at any other. If the digestive system in the earlier stages of childhood is thus liable to incessant irregularities, and as from its widely spread sympathies it acts so prominent a part in the induction of disease, an attention to diet, as belonging to those causes which operate directly on the stomach, is of some importance : it also deserves to be borne in mind that, while the tone and energy of the digestive apparatus are impaired under the

powerful impression of the heats of our summers, its excitability is at the same time to a greater or less degree exalted. Under such circumstances, is it possible that the assimilative organs of the infant, heretofore accustomed to the greatest simplicity of food, can bear with impunity the mixed and varied diet of the adult, unless very gradually induced? The irritation produced by irregularities in the quality or quantity of their food, and aggravated by some one or other of the preceding causes, shall lead sooner or later to inflammatory affections of the intestinal canal.

"The stomach crammed with every dish,
A tomb of boiled, and roast, and flesh, and fish,
Where bile, and wind, and phlegm, and acid jar,
And all the child is one intestine war," &c.

Yet whatever consideration attaches to irregularities in diet, difficulty of dentition, &c. I am disposed to consider the violent heats of the summers, in conjunction with sudden ærial vicissitudes, or with exposure to a moist and vitiated atmosphere, as the most usual exciting causes of this complaint.

"Hinc hominum pecudumque lues hinc pestifer aer."

The constitution of the infant, though endued with greater susceptibility, possesses, at the same time, more pliancy than that of the adult; yet however the flexibility of its system may enable it in a healthy condition to endure such ærial vicissitudes, in certain conditions of the system, it has an excessive sensibility with respect to such changes. Neither are the simple indications of the thermometer capable of affording a correct test of temperature as it affects the system, nor is it possible to express the modifications produced by heat and moisture, supposing them to be easily known, which shall be applicable to every relative situation of the individual. After very considerable diminution of temperature, the cutaneous organs, from the accumulated excitability which takes place to a greater or less extent, are rendered more susceptible to the impressions of heat, though less in degree than that immediately preceding the

change. While sudden reductions of temperature, whether arising from falls of rain, exposure of a heated body to a current of air, &c. (for we need scarcely remark that temperature is relative, depending on the state of the body at the time, susceptibility, habits of living, &c. &c.) produce similar results in the assimilative organs.

Such vacillations, if frequent and sudden, occurring between the cutaneous secretion on the one hand, and that of the digestive canal on the other, as they render the system more accessible to the impressions of external agents, so they diminish the capacity of resistance to the operation of their noxious qualities. And as the tone and energy of the digestive organs under the increased action of the cutaneous vessels becomes impaired, while its irritability under the powerful impression of the heat is increased, it is thus more readily disposed, especially when subjected to the concurrent influence of some of the above causes, to take on inflammatory affections.

Thus conditioned, the digestive organs in turn exert an unfavourable influence over the organs with which they sympathize;—the cutaneous vessels, &c. which, from the greater demands made on their secretory functions during the heats of summer, are already disposed to fall into a collapsed state. What, under these circumstances, must be the consequences of exposure to a moist and vitiated atmosphere, &c.? Exhausted by the previous excitement, these vessels cease in a greater or less extent to discharge their usual functions; an undue proportion of the circulating fluids is thrown upon the internal organs; they become engorged; febrile movements next ensue, and cholera is lighted up.

This state of things takes place the more readily amongst the infantile population of our cities, little exposed or inured to the open inclemencies of the skies, the surface of their bodies becomes highly susceptible to ærial transitions; on the contrary, those brought up in the country, continually exposed, imbibe the influences of the atmosphere at every pore, and though nurtured in many situations amid the vapours of

rivers, the exhalations of marshes, and the noxious effluvia of decaying animal and vegetable matters, escape too frequently unhurt for us to rely with much confidence on the boasted efficiency of marsh miasms.

As this disease makes its appearance nearly at the same time that bilious fevers and other disorders of the biliary organs are known to prevail, and seeming to arise from causes nearly of a similar nature, viz. sudden vicissitudes of temperature accompanied with moisture; and as the varieties in the form and aspect of these diseases amongst individuals can be accounted for, from constitutional predisposition, habits of living, priority of diseased affection, &c. it would be contrary to the acknowledged simplicity of nature to seek for the grounds of these differences in a diversity of agency. However various the aspect may be under which they show themselves, the hepatic system is invariably to a greater or less extent deranged; it is true that the intestinal canal, as from what has been observed might be readily suspected, also greatly suffers in this disease.

Yet the characteristic symptoms are nearly the same in all, and differ only in degree; hence, whether we term it simply the Cholera Infantum, or the Febris Remittens Bili-osa in intestinas introversa, &c. &c., we consider them to be radically the same, and to be cured on the same general indications.

So distressing, in some cases, are the effects of the gastric irritability, that we are under the necessity of resorting at once, to such means as are calculated to allay its violence, as lime-water with milk, &c. or, what is far preferable, solutions of the bicarbonate of potassa, adding a few drops of laudanum or paregoric elixir. In several instances, I have been enabled by this remedy alone to subdue the disease; but even where it does not prove so successful, it assists in allaying pain, and in removing other distressing symptoms in every stage of this complaint. If these, however, should not effect a removal of the vomiting, a blister

over the epigastrium will scarcely ever fail; but rarely, indeed, are we under the necessity of resorting to such an heroic measure. After this object has been accomplished, we next have recourse to such remedies as act on the whole line of intestines, preferring such as at the same time promote all the secretions, biliary, &c. for the nature of the stools, their variegated appearance and offensive odour, point out the necessity of correcting this morbid disposition. Calomel, by common consent, has been dedicated to this purpose. As mere evacuants, castor oil with a little laudanum—magnesia or senna with some carminative, will answer very well—the frequent use of purgatives, the saline especially, is carefully to be avoided, as apt to increase the already excessive irritation; for the evacuations, though of an unnatural appearance, the result of altered secretion, are symptomatic of the disease, and not a cause of the phenomenon. In the commencement of this complaint, where there is much febrile excitement, and especially if the child be of a plethoric habit, and had been in the full enjoyment of health immediately previous to seizure, would not bleeding be attended with considerable benefit, in relieving congestion in the liver and portal circle, and by obviating a tendency towards inflammatory affections of other important organs—the brain, &c. &c. thus prepare the way for the more speedy and effectual operation of other remedies. Children can bear the loss of blood much better than has been generally supposed. In the cholera immediately subsequent to the fatal epidemic of 1793, Dr. Rush informs us that he applied to the lancet with great freedom.

But it is in calomel we chiefly confide, as possessing properties that eminently adapt it to this disease: the effects of mercury, however, are not to be estimated solely from its purgative quality, but by its specific action on the hepatic system, and its power of affecting, through the medium of the circulation, secreting surfaces endowed with high irritability, and in a state of inflammation, either alone, or combined with ipecacuanha and opium, in quantities, and at

times proportionate to the urgency of the symptoms, our medicine will rarely fail to bring down bilious stools, precursors of a better state of things, to calm irritation, and to determine to the surface. Yet the effects of mercury do not always depend on the quantity introduced, but on certain conditions of the system, by which the latter is rendered more or less susceptible of its action ; this is known by the improvement which sooner or later takes place in the nature and consistence of the matters discharged, which, from being watery and offensive, variegated and bloody, assume under its operation, more or less, their natural colour and consistence, and lay aside the peculiar odour so characteristic of the discharges in this disease, as in those labouring under this disorder, there prevails more or less torpor of the surface, denoted by the harsh, dry, and shrivelled skin, with much inequality of temperature, it becomes highly important to rouse anew the energies of the cutaneous vessels ; the tepid bath, under these circumstances, has been attended with marked benefit, impregnated, when we wish to make a powerful impression on the surface, with common salt, or where there is any tendency to sinking, with mustard, or cayenne pepper, or brandy, or slightly with nitro-muriatic acid. In extreme cases, frictions with tinct. cantharides and turpentine, have been used for a similar purpose. Would not embrocations with tartar emetic ointment in urgent cases be preferable? for though this produces its effects in a more gradual manner, yet these are less evanescent and more consonant to the processes of nature herself. In slighter cases, to meet the same object, and to allay local pain, the warm spice plaster, or fomentations with aromatic herbs, &c. have been applied over the abdomen. Where there exists much heat of the abdomen, with great determination to the head, sponging with cold water, or vinegar and water, will be found of benefit ; but the cold bath, except in the very onset, when we can promise ourselves sufficient reaction, is not indicated. Where the extremities are cold, warm pediluvia, with the use of long woollen stockings, will render the little patient's

condition more comfortable. To allay the painful griping, &c. farinaceous or mucilaginous anodyne injections, repeated every two or three hours, according to circumstances, will afford great relief; injections of cold water have been recommended with the same intent. The sugar of lead, which, of late, has attracted attention from the profession, as a remedy in several of the affections of the bowels, has been not a little used in this. Combined with calomel, or after this has produced its specific effects, either alone or in conjunction with opium, in doses of one or two grains of the former to one-eighth of the latter every two or three hours, according to circumstances, it effects a removal of pain; relieves the tormina, &c.; this is however no new practice. We sometimes meet with cases towards the close of which the dejections, though of a natural colour, are much too frequent, arising out of the highly irritable condition of the lower bowels; in such injections of the superacetate will afford signal relief even after the failure of the most powerful vegetable astringents. To allay the excessive and almost indomitable thirst more or less present in every instance, mucilaginous drinks, (slippery elm bark) given in small quantities at a time, and frequently repeated, or weak solutions of the bi-carbonate of potassa as before mentioned, will answer better than any thing else. Towards the latter stage, however, when our little patient is in a sinking condition, weak wine and water, &c. will be found necessary; precisely under these circumstances small doses of cinchona often produce the most salutary effects; or when its internal use is impossible, &c. a jacket quilted with the bark, will sometimes answer our wishes. I have noticed *en passant* the close connexion of hepatic derangement, whether functional or structural, with cerebral disturbance, from its more *simple* to its more *complicated* terminations, so much so that it is more or less an attendant on every case of cholera, supervening in general rapidly; in others following at a distance; so frequently indeed does encephalic disturbance go hand in hand with hepatic derangement that, when pre-

sent, it should induce us to examine with the greatest attention the various symptoms as they arise, recollecting to direct the energy of our measures to the one or the other in proportion to their urgency, thus, while we combat the one by cold applications, &c. to the head ; we should continue to urge with a firm hand, more especially if there be any tenderness or swelling in the right hypochondrium, the exhibition of mercury with mercurial frictions, tepid nitromuriatic acid bath, and such other auxiliary means as are calculated to restore the liver to its usual and healthy grade of action. This condition of things, however, is rather to be considered as a sequela of this disease ; but when it does occur, it generally supervenes so immediately on the cessation of the more urgent symptoms of the original complaint, that it is necessary to notice it in this place.

As an adjuvant, a flannel shirt well fitting, or flannel bandage round the abdomen, will be found in many cases very serviceable. Gestation of such a kind as our little patient can bear will conduce much to the amelioration of the disease, as I have, to my no little gratification, in more than one instance experienced. Notwithstanding all our boasted remedies, I regret to add that often all are administered without putting an end to its ravages ; in such our only resource, the ultimum remedium, lies in the cool air of the country, for to this and to its more equable condition we believe the country air is indebted for its supposed efficacy, as the foul and heated urban atmosphere must continue to prove a constant source of irritation.

Death has been known to have taken place within the 24 hours, but is commonly protracted to one or more weeks ; in such its approach is gradual, and is preceded and attended by a number of distressing symptoms, as extreme emaciation, lividity of the surface, maculæ, hiccup and aphthæ. Few recover after the presence of the latter symptoms.

Dissections.—The principal and most usual phenomena that present themselves to notice in our post mortem exami-

nations are lesions, more or less extensive, of the digestive system, with its appendages; marks of inflammation are evident, confined most generally to the mucous membranes, occasionally however extending to the adjacent tissues: in some these traces of antecedent inflammation were found diffused or scattered in irregular patches throughout the whole range of the digestive tube; while in those where the disease had assumed more or less the form of dysentery, the lower bowels appeared to have been the principal seat of suffering; the coats of the intestines being thickened and contracted, or ulcerated and gangrenous. In others again so trifling were the marks of preceding inflammation, that we are at a loss to what circumstance to attribute the death of our patient, except to excessive exhaustion or a peculiar state of the cerebral organs. In two cases, where death took place very suddenly, the intestines were discovered to be in a state of intussusception.

The hepatic system also claims our attention; the derangements, whether functional or structural, that have accompanied this disease, or present themselves at its termination, assure us that this system exerts no ordinary influence in the development and duration of this complaint; the gall-ducts, from the previous violent spasm, are found more or less in a state of constriction; the gall-bladder sometimes filled with yellow or greenish bile, at other times contracted and nearly empty; the liver itself increased in size, and altered in condition, indurated or soft and flabby.

ART. IV. *An account of the removal of a large Indolent Tumour, situated on the thigh, by the use of Caustic.* By HORATIO G. JAMESON, M. D. Surgeon to the Baltimore Hospital.

SOME time in the year 1809, Mr. Mauter, a respectable farmer near Hanover, Pennsylvania, brought to me his son, affected with a very large tumour on the left thigh. He in-

formed me that, some years before his call on me, the boy had been affected with an extensive abscess, and that, owing to some occurrence which I do not now recollect, it was not opened. After some delay it was found that the *collection* was removed by the absorbents, but a hardness, or what has been termed a core, remained in the part. This after some time began to swell, and to extend itself around immediately under the integuments, till it amounted to a very extensive and frightful-looking tumour; the size of which was so considerable, at the time I saw him, as very much to distort the limb, and cause considerable lameness.

Mr. Mauter was extremely anxious to have something done for his son, a promising boy of about fourteen, and in perfect health. He had come past the physicians of Hanover to me, at Gettysburg. This circumstance, I must confess, served to excite my ambition, or perhaps my vanity. I requested him to remain over night in town—that I would take the case into the most serious consideration, and, if any thing reasonable suggested itself to my mind, I would be prepared in the morning to give him my opinion of the case. My first conclusion, after reflecting upon the case, was that I should do myself most honour by advising Mr. Mauter, who was a wealthy farmer, to consult Dr. Physick, believing that the boy would be most likely to be relieved by that able surgeon.

But weighing the matter still further, and endeavouring to settle in my own mind what course Dr. Physick would probably pursue in such a case, I was led to the conclusion that Dr. Physick's pre-eminence in a simple case of surgery lay in his dexterity as an operator, and his superior judgment as to circumstances under which an operation ought to be performed. But I felt convinced that in this case Dr. Physick's judgment might be placed on a level with that of any ingenious practitioner; since to operate with the knife was obviously out of the question: neither could amputation be practised without cutting through the tumour, owing to its being situated high upon the thigh.

A thought struck me that there was but one method possible, by which the disease might be removed, and I supposed that even Dr. Physick might not think of it. I hope I shall be pardoned for using a little egotism here, since I do believe that, in this instance, I thought of, and pursued successfully, a plan which would not have occurred to any other man. In short, then, I determined to cut through the integuments, and if the tumour was sufficiently indolent, (which I had reason to believe was the case, as the boy had not had any pain, except what arose from the extreme tightness of the skin,) that I would attempt the destruction of it by caustic, without injuring the skin. I made an incision about an inch and an half in length: such was the tension of the skin, that the opening assumed nearly a circular form. I now passed in a long sharp-pointed needle, and found it gave almost no pain; yet the tumour was most plainly sarcomatous, and possessing considerable firmness.

I now agreed to undertake the case, and began by passing a long needle, in two or three directions at a time, into the tumour, endeavouring to keep as near the middle of it as possible. Into each of the punctures, as they were severally made, I injected a thin paste of arsenic, gum arabic, and water. At first I repeated daily, and the boy had no pain. After some days he sometimes complained, and could not submit to the operation every day; a day or two was suffered to intervene now and then. A very copious discharge was established in a few days; the tumour began to subside, and at the end of the fourth week he went home nearly well; so far recovered, indeed, as to require no further use of the caustic. In a little time he was well. My apparatus consisted of a long seton-needle, which had been made for carrying a seton through the openings at either end of a very extensive abscess, and a tin tube, a little larger than a coarse knitting-needle, about eight inches in length, fitted to a common penis syringe.

The tumour was about twelve inches in length, eight in width, and one and a half thick in the middle. From the

middle it gradually tapered off so as to present a thin edge. In acting upon the edge there was often considerable pain produced; but it was always such as the boy could bear, without much complaint. I was careful to injure as little as possible the sound flesh.

From the fact that there was no pain in the tumour, and its firm and perfect organization, I have no hesitation in asserting positively, that there was no sign of suppuration when I began, and it is equally certain that it would not have occurred, since the tumour was growing rapidly.

It may also be confidently asserted that this case could not have been cured in any other way. To have dissected the tumour out, nearly one-third of the skin of the thigh would have required detaching; and the base of the tumour being its largest part, and that firmly connected to the fascia of the thigh, no operation by the knife would have been practicable.

About a year after the patient's return home, the part swelled and put on a threatening appearance. The old cicatrix opened, and a considerable discharge took place. He was again put under my care. I commenced introducing the red precipitate of mercury, as I had done the arsenic last year; but there was no longer any substance sufficiently insensible to admit of my puncturing under the integuments. He became fretful in a few days, and desired much to go home. I desired his father to place him under the care of a physician in Hanover, who I had no doubt would approve of a continuance of the injection of mild escharotics. In a little time the limb was perfectly sound, and has remained so. I saw the boy, several years after he had been cured, walking without any lameness: and his father, within the last three or four years, has told me that he remained perfectly well.

That the person named in this report owes his recovery to the plan adopted, and that this was the only method by which he could have been cured, is to me a thing altogether unquestionable. That a similar plan, prudently employed

in cases where the knife cannot be used, would often be attended with like success, I have no doubt. Mr. John Bell seems to have been disposed to try, or at least to recommend, a similar plan in certain cases; but I am not aware of his having ever tried the plan in his practice. In speaking of the case of "Jenny Brown," he indulges in a little speculation of the sort in question. He says, "It is possible to penetrate so into the body of the tumour with caustic, as to pass a ligature through its centre, and, after extirpating the chief mass by stricture, to destroy the roots by a continued use of caustic."

ART. V. *Experiments on the Sensibility of the surface of the Face to Light.* By S. COLHOUN, M. D. of Philadelphia.

A BOY, whose face was burnt by the explosion of some gunpowder, could not bear exposure to the ordinary light of a window; he expressed great uneasiness, even when the eyes were closed: this circumstance led to the following experiments.

Expt. 1. The eyes of a person in health were closed, and covered with compresses, so as to prevent vision completely; a lamp was burning upon the table; the whole face was shaded by interposing a book, and the darkness was immediately perceived; the forehead was covered, and in five instances the shade over that particular part was distinctly designated. The experiment was repeated several times, covering the forehead and then the lower part of the face, and with the same results. The accuracy of the perception of light and darkness in different parts of the face, however, could not exactly be perceived after the eyes had become pained from continued pressure from the compresses, in consequence of the attention being diverted from the experiment, by that circumstance.

Expt. 2. A patient recovering from remittent fever was confined to a dark room ; her eyes were covered with compresses and bandages so as completely to exclude the light : a curtain was then raised, and the light admitted ; the forehead was shaded by interposing the hand, and the person immediately perceived the effect : the lower part of the face was shaded in the same way, and the abstraction of the light from that part was immediately perceived ; though she said the difference was not so perceptible as when the forehead was shaded. When one half of the forehead was covered, she said that the shadow was coming over her face ; on a second trial, she told the precise part that was shaded, whether on the left or right side. Her eyes now began to pain her and the experiment terminated. A small blister was applied to a part of the forehead in which there was pain during the paroxysms of her attack. After the blister had slightly skinned over, it was exposed to light, but there was no peculiar sensibility in it.

Expt. 3. The same experiments were repeated several times in the sunshine, and with the same effect ; the different parts of the face exhibiting considerable sensibility to light. The eyes were covered with thick folds of soft leather, and completely protected from the light, and when the shadows of different bodies were cast upon the face, they could be distinctly perceived, and the parts on which they fell immediately designated. These experiments were repeated, in the presence of several persons, and with the same results.

Some additional observations have been made, which convinced me that the surface of the forehead possesses the perception of light in a much greater degree than the lower part of the face. The skin of the neck and body have no perceptible sensibility when exposed to the light of the sun. Subsequent observations prove that the feeling produced by light varies much at different times.

ART. VI. *Reflections on the Treatment of Fractures of the Lower Extremity, and a Description of a New Apparatus; with Cases.* By J. AMESBURY, Member of the Royal College of Surgeons in London, &c. &c.

(From the Quarterly Journal of Foreign Med. and Surg. for July, 1822.)

DISEASES have at all times claimed attention in proportion as they interfere with the comforts of social life. The nature of many of these is known, and the principles of treatment well understood. There are others, however, concerning the treatment of which there yet remains much disparity of opinion, and this disparity alone is sufficient to show that there is, in these diseases, room for much improvement. This is the case in the treatment of fractures of the lower extremity, upon which I intend to make a few observations.

It is not my intention, on the present occasion, to enter into a full description of the nature and cure of fractures of the leg and thigh. I merely wish to throw out a few remarks on the mechanical treatment; which I have found advantageous in my own practice; and which may prove useful to others.

At present the treatment of these cases is extremely various. Some practitioners place the limb in the straight position, on the heel; others in the bend; others, again, slightly bent, upon the side. Some make use of splints only sufficiently long to surround the broken bone; others, of a length to reach from the pelvis to the foot. Some make use of a fracture box; others, of an inclined plane. Some place the patient on a feather-bed; others, on a mattress. The existence of so many plans of treatment, points out to us that all of them have their advantages as well as their attendant evils; for if any one method was far preferable to the others, that one only would be adopted.

In the treatment of fracture, it is ever to be remembered, that the bones are entirely passive; that when once placed right, they would of themselves ever remain so; that the muscles, pricked and torn by the sharp and ragged edges of the broken fragments, oppose the only resistance to reduction; and tend to disturb the coaptation when the bones have been once properly adjusted. In this they are assisted by accidental causes;—the patient's attempts to ease himself from an irksome position; his coughing, sneezing, &c. shake the body and upper part of the limb, and are often sufficient to displace the fragments; and thus indirectly irritate the muscles, and produce in them spasmodic or convulsive action, which is frequently followed by a host of ills which I need not mention.

Are not these indications to remove, as far as possible, all those causes which tend to displace the fractured bones; stretch and lacerate their already inflamed and tender fibres? Causes which might be removed and effectually prevented, by keeping the fractured parts in a natural position and quiescent state.

The muscles do not voluntarily contract upon a broken bone; but their tonic power or involuntary contraction is continually exerted and increased in proportion as they are irritated by mechanical or other stimuli. We do not see them attempt to raise a broken thigh; but we see their involuntary contraction, slight when the limb is smooth and even, and augmented in proportion as they are irritated, pricked, and torn by the serrated ends of the broken bone.

The soft and yielding texture of the muscles is calculated to oppose but little mechanical resistance to lateral displacement; hence, in oblique and comminuted fractures, lateral displacement is easily effected; and as soon as the fragments are thrown out of their natural position, the muscles contract more forcibly, and increase the displacement. They cause the bones to ride, and to penetrate their bellies; and then, as if mad at the very evil they had produced, they act with ten-fold vigour, and occasion, not unfrequently,

permanent shortening of the limb, or inflammation and abscess, and sometimes death.

Seeing, then, such mischief occurs from the irritation produced by the displacement of the bones, it is an imperative duty we owe our patient to put them in a natural position, and, if possible, to prevent them from moving, and injuring the soft parts; hence arises a question;—what position is the most natural, for instance, in fractures of the thigh,—injuries which so frequently lame the patient and disgrace the surgeon,—injuries, the results of which are too often living monuments of our want of skill.

What I have here stated, I must beg will not be misconstrued. I do not mean to arraign any particular kind of practice. I merely wish to show that the common modes of treating these accidents require much amendment.

Desault laboured hard to prove, that, in fractures of the thigh, the straight position is the most adviseable. The arguments he brings forward in support of this doctrine are plausible; but, as far as I am able to judge, are not sufficient to support it. The principal are these: the facility of applying extension and counter-extension at a distance from the fractured bone; for instance, from the foot and the pelvis; the ease with which the two limbs can be compared, as to length and position,—the greater ease of this position to the patient, when compared to that on the side; the leg can be fixed more firmly; it can be adopted when both thighs are broken; and experience in France was favourable to the practice.

Were we to resign the privilege of thinking for ourselves, and mould our opinions upon the authority of others, however high, we should often fall into very avoidable errors. Implicit confidence is not required from man to man. Though this celebrated surgeon was accustomed to examine minutely the different diseases that came within his notice; yet it is to be expected that his numerous avocations must have sometimes disturbed that serenity of mind which the full consideration of many of them require. Under

this impression, I trust I may venture, without fear of being accused of arrogance or presumption, to offer a few observations, which may tend to throw some light on the mechanical treatment of injuries of so much interest to the patient as well as to the surgeon.

To judge correctly of the proper position of the limb in a case of fracture, we must take into consideration the natural form of the fractured parts, and also those powers which tend to displace the bone when broken. What then, for instance, is the natural form of the femur? not straight, as the practice of placing the limb in the straight position would indicate, but it forms a segment of a large circle, whose convexity is placed before, and concavity behind. The points of support, therefore, when this bone is placed upon a plane, with its concavity towards it, are the ends; and the effect of fracture through its middle would be, to divide the segment of a large circle into two segments of a small one; and the middle of the bone, being unsupported, would reach the plane, and the lower edges of the fractured ends would be exposed, prevented from uniting, and ready to prick and lacerate the surrounding textures.

Fractures may take place at any part of this bone, from its condyles to its very head; and it will be seen, that the direction of the fractured ends, and the difficulty of treatment, are greatly modified by the action of the muscles; the degree of laceration of their fibres at the site of fracture; the situation of the fracture; its direction, whether transverse, obliquely forward and upward, or, in other words, downward and backward, obliquely upward and backward, or, which is the same, downwards and forward; or obliquely to either side.

When the thigh is amputated high up, the flexors often act so powerfully as to place the stump, for a time, nearly at right angles with the pelvis; hence it must be evident, that when there is a solution of continuity in the bone, the muscles which tend most to displace the upper fragment, are the iliacus internus and psoas magnus; and the effect of

their contraction is more or less powerful in raising the upper part, in proportion to the distance of the fracture from the point of their insertion, or the length of the lever by which they are resisted. But what muscles act most upon the lower portion, so as to produce displacement in the transverse direction? It will be recollected, that the fixed points for the action of the gastrocnemius and popliteus are, in the natural state, principally the condyles of the femur; and that their contraction assists in the extension of the foot and flexion of the leg. But fixed points are considered as those which oppose the greatest resistance to the action of muscles; hence it will appear, that those points which, in the natural state, are the most fixed, may, after the accident, become the most moveable. If a muscle were attached to two bodies which oppose an equal degree of resistance to a contraction of its fibres, these two bodies must move with an equal degree of velocity towards its centre; but if one of these bodies be more fixed, either by weight or length of lever, than the other, the lighter body must move towards the heavier or more resisting, in whatever manner the resistance may be produced. From this it will appear, that when a fractured thigh is placed in the extended position upon the heel, the fixed points for the action of the gastrocnemius and popliteus are, pro tempore, no longer in the condyles, but at the points of their insertion; therefore the contraction of these muscles tends to carry the lower fragment in a direction directly opposite to that of the upper; and this with a degree of force proportionate to the distance of the fracture from the lower end of the bone. If the solution of continuity be across the upper third, the transverse displacement, as far as the muscles are concerned, is principally produced by the action of the iliacus internus and psoas magnus; and if near or through the condyles, by that of the gastrocnemius and popliteus:—the former muscles move the part to which they are attached, upward and forward; and the latter, downward and backward; thus the upper portion is bent upon the pelvis; and the

lower is bent upon the leg. The straight position puts these muscles into a state of tension, and consequently increases their power over the unresisting fragments. The transverse displacement being once produced, the extensors and long flexors of the leg are goaded into action, and assisted by the triceps adductor femoris, and if the fracture is high up, by the pectineus; they contract forcibly, and draw up the lower portion, which glides beneath the upper,—sometimes the distance of several inches; and at last comes in contact with it at a considerable angle. From these causes arise pain, spasm, inflammation, abscess, deformity, and lameness.—Other muscles tend to produce displacement in the transverse direction,—a displacement which must necessarily precede shortening of the limb.

From what has been said, it will appear that the objections to the straight position, in a case of fractured thigh, are numerous and weighty.

Mr. Pott had the honour of pointing out the advantages we gain by bending the limb, and consequently relaxing the muscles, which tend most to disturb the fracture; and to forward his views upon this subject, he laid the limb upon the side, in the half-bent position. In this posture the limb may be placed at any angle the case may require, and forms, from the trochanter to the foot, a line straight enough to lie sufficiently smooth upon a plane, provided the trunk also is placed upon the side; and if the patient could maintain this position during the period of cure, the limb may be straight and perfect; but he soon becomes tired, and turns upon his back. By this rotatory motion, the trunk carries with it the upper fragment of the fracture, while the lower portion and the leg continue as they were placed: and hence arises eversion of the foot, a species of deformity which, in this kind of treatment, is with difficulty avoided, and is every day occurring.

Desault placed the limb in the straight position, because it better enabled him to apply extension at a distance from the fractured bone. Pott believed he could avoid the neces-

ality of this by bending the limb. This, he conceived, would prevent the contraction of those muscles, whose action Desault endeavoured to resist. Practice, however, does not fully bear him out in his views upon this subject; for it is found that a mechanical extending force is sometimes necessary, even when the limb is in a state of flexion.

Surgeons have seen the mischief which arises from placing the limb in the bent position upon the side; and the advantages which accrue from relaxation of the muscles: they have, therefore, laboured to avoid the former, and to avail themselves of the latter indications. Their reflections upon this subject have led to another plan,—the bent position upon the heel. This is not subject to the evils which attend the straight position, nor those which we observe in the bent upon the side. Of the three, this is the most easy to the patient, and is with the least difficulty maintained. It allows the limb to be placed at any angle the case may indicate, and consequently of the relaxation of those muscles, which tend more powerfully than any others to displace the fragments.

The common means made use of to keep the limb in this position are not without objections, and to these we must attribute the variety of plans we daily see adopted. Some practitioners adhere to this, while others follow that prescribed by Desault, or that advised by Pott.

But whoever attends strictly to the treatment of these injuries, will find that any one position, long continued, is extremely irksome to the patient, and in the young and irritable can scarcely be maintained.

For fractures of the leg the same positions are advised as for fractures of the thigh, and in these accidents the same advantages may be gained by relaxing the muscles; and several objections may be started to each particular mode of treatment.

When both bones are fractured, and the limb is placed upon the heel, we daily see great difficulty experienced in keeping the fragments in apt and proper contact. The pads

and pillows made use of for this purpose cannot be with sufficient nicety adjusted, to maintain the limb in that position which a favourable result requires. The surgeon, therefore, at every visit, finds something to attend to,—the heel is raised too high, and the bones consequently bowed backward, or it is sunk too low, and the fracture yields in an opposite direction. He is frequently obliged to replace his pads, pillows, brick-bats, and other contrivances, used to supply the deficiency in his splints, and as frequently produces more or less motion between the fractured ends. This motion much retards the union, and is one of those causes which prevent it altogether.

To the practice of placing the limb upon the side, the same objections may be urged as in fractures of the thigh, though they do not apply so forcibly to the former as to the latter cases.

That the motion of the body, in the direction I have mentioned, is the cause of the eversion of the foot, will, I think, readily appear by placing a subject upon the back, with the leg semiflexed, and laid upon the side. Unless the leg be very much bent, the thigh and upper part of the leg will not come in contact with the plane upon which the subject lies. The heel, acting as a lever, keeps the foot everted, and thus the foot and lower part of the leg, forming points of resistance to the action of the adductors of the thigh, maintain the limb in a twisted position, which, if there be no solution of continuity in the bone, soon becomes painful; but if a fracture exists, the patient is quickly relieved by the rotatory motion which takes place between the fractured ends. This temporary displacement must be well attended to, or permanent deformity will certainly ensue. I would contend not, however, for the practice of placing the limb upon the heel or upon the side, but for that practice which relaxes the muscles, and allows the patient himself to place it at pleasure, according to his feelings, upon one or the other, without any danger of disturbing the coaptation of the fractured parts.

I have just touched upon some of the causes of deformity and lameness, which too often result from fractures of the leg and thigh, in order that what I have to add may be better understood. I would have entered more fully into these causes, but I am fearful of extending my subject beyond the limits of a paper; and of intruding too much on the pages of your valuable Journal.

Having cursorily pointed out some of the difficulties we have to encounter in the treatment of these accidents, let us now inquire if there be any means by which we can avoid them. But before we enter upon this subject let us stay for a moment, and consider wherein the means in common use fail to effect the desired end. The mechanical powers now commonly adopted to fix the fractured parts are either the short or long splints, the fracture box, or inclined plane.

In order to show how far the short splints produce the effect for which they were intended, I made the following experiment:—I divided a stick half an inch in diameter, and two feet long, into two equal parts, and one of these I again divided into two parts, of equal length. The two shorter pieces I intended to represent the two fragments of a fractured thigh, and the longer the leg in a natural state. I then connected, by means of a hinge-joint, one end of the longer piece with one end of one of the shorter, and having brought one end of each of the shorter pieces into contact, as they lay in a straight line, surrounded the shorter pieces their whole length with muscular fibre, one inch and a half in diameter, placed in the longitudinal direction, and secured with small twine. Over the muscular fibre I laid slips of deal, in the usual way of putting up a fractured thigh, with short splints, and confined them with tapes moderately tight. Having laid the whole upon a plain surface, I rotated the longer piece uncovered by muscular fibre, and found, as I expected, that the motion was lost between the shorter pieces; and that no motion was given to the upper of these, except what was communicated to it through the medium of the muscular fibre; and that the

centre of every kind of motion which did not lose itself in the hinge-joint, was placed between the approximated ends of the shorter pieces. From this experiment it appears, that when the thigh is broken and put up with short splints, by which I mean splints that extend from the pelvis to the knee, motion given to either end of the limb is lost in the site of fracture.

But it may be said, that these splints are to be confined upon the limb not only moderately, but very tight. Still, I would ask, is this to be recommended? Though the pain and tension which too powerful compression of the thigh produces may be materially prevented, by the judicious application of a bandage, yet there remains another objection to this practice, which ought to engage our attention, and this is the danger of pressing a portion of the soft parts between the ragged ends of the broken bones, a circumstance which would prove an almost insurmountable impediment to the very thing we are most anxious to bring about, a good and speedy union. Again, if we did not, by such tight compression, incur the danger of forcing a portion of the soft parts between the fractured surfaces, we could not, consistently with the safety of the limb, put the short splints on sufficiently close to prevent any motion from taking place in the situation of the fracture, when either end of the limb is moved. These splints, therefore, fail to accomplish the purposes for which they were constructed; they fail to maintain the proper coaptation of the fractured parts, and to prevent any motion between them.

What I have here stated with regard to the short splints for fractures of the thigh, will also apply in some measure to those in common use for fractures of the leg. They do not provide against motion, which impetus given to the limb produces in the fracture; there is nothing in their construction to support the heel and sole of the foot; parts which in the treatment of these accidents deserve our serious attention; nor unless they are kept very tight upon the limb is the lever above the knee sufficiently long to guard against eversion.

They are simple, however, and easy of application ; but when we have an important object to accomplish,—when the limbs or the lives of our fellow-creatures are in danger, utility and efficacy must be borne in mind. Is it no small matter to suffer the pain and inconvenience arising from these injuries, and afterwards to be deformed and lamed for the remainder of our existence ? It has been said, that we should bring down our mechanical contrivances to the comprehension of the dullest capacity. This is a good rule, and should be as far as possible adhered to ; for simplicity, combined with utility, is excellency in these things. But if I were called upon to define what I mean by the term simplicity, as applied to a piece of machinery, I should say, it signifies that which answers the same intentions by the fewest means ; or that which has in it all that is useful and nothing superfluous ; and I cannot help thinking, that surgery stands in need of this kind of simplicity in the construction of its instruments.

If we consider the motions of the limb in the natural state, we shall find, that the leg is passive to the motions of the foot ; the thigh to the motions of the leg ; and the pelvis to the motions of the thigh ; hence we should infer, that if the foot and thigh were fixed by a continuity of splint, the leg must of necessity become fixed also ; and if the foot and pelvis could be fixed so that no motion could take place in the one without passing over to the other, the thigh also would become a fixture.

To illustrate this point, and to see what we gain by fixing the whole limb, in the treatment of fractures, I covered not only the shorter pieces of the stick above mentioned, but also the longer with muscular fibre, while they remained in the same relative position as described in the last experiment ; and having fixed a cross-bar to the lower end of the longer portion, I applied slips of splint two feet long,—the length of the three pieces upon the muscular fibre ; and confined them to this and the cross-bar, with small twine. The whole was now placed upon a plane, and rotated and moved

in different directions, by applying the hand to the cross-bar ; and it was found that any motion given to the cross-bar, which was intended to represent a foot-board, was not felt between the approximated ends of the shorter pieces, but was propagated over them, and lost at the upper end of the splints,—a situation intended to answer to the hip-joint in a case of fractured thigh.

This experiment, rough as it is, is sufficient to show, that when the thigh, leg, and foot are fixed, by any inelastic body continued from the one to the other, motion between the fractured ends of the thigh-bone, from an impetus given to the limb below the site of fracture, is effectually prevented.

It will be seen, from what was stated in the first experiment, that the advantage here gained arose from fixing the splints to the cross-bar ; hence it must be evident, that any motion given to the upper of the shorter pieces, which was in no way connected to the splints, by applying the fingers to its projecting end, would still have had its centre between the lower end of this piece and that with which it came in contact. This is precisely what would occur in a fractured thigh put up in the manner indicated by the last experiment, if the pelvis could not move upon the femur ; and if it were unconnected to the splints which fix the knee and ankle. But it will be recollected, that the pelvis has free motion upon the thigh in every direction ; therefore it is not necessary that the upper fragment of the fracture should move if the pelvis moves.

Supposing the lower part of the limb not under the command of the patient, those movements of the pelvis which carry it out of a line with the thigh bone, must necessarily affect the fracture ; but if the whole limb is fixed to the hip joint, and the fracture is not so high up as to prevent the splints from holding the upper fragment firmly, the patient is able to direct its motions upon a plane, whether the limb be bent or straight, and therefore can make it follow the mo-

tions of the pelvis, and consequently has it in his power to avoid the displacement which might otherwise ensue.

But it will be seen from what I have advanced, that if the pelvis could be fixed upon the thigh by a continuity of the same means that fix the foot and leg, motion given to either end of the limb would be still less likely to affect the fractured parts. Supposing the limb, with the thigh bone, fractured, put up as the last experiment would indicate, motion given to the foot would not have its centre in the hip-joint, but would pass over it to the pelvis; and if given to the pelvis, it would not be felt in the site of fracture, but would be propagated along the splints to the foot, which, however, would not feel it but in common with the leg and thigh: and as far as it regards the motion given to the limb from external causes, this would be the case, whether there exist, between the pelvis and the foot, one fracture or a dozen. Hence it would appear, that any plan which would enable us to fix the pelvis upon the thigh by the same means that fix the foot and leg, is in some respects desirable.

If what I have advanced be found to be correct, the treatment of fractured legs will become extremely simple, and that of fractured thighs comparatively easy.

Desault knew that some advantage was obtained by fixing the whole limb in fractures of the thigh, but he seems to have made use of the long splint, in order to keep up extension in the straight position, and at a distance from the fractured bone.

Mr. Pott was convinced that much benefit was derived from relaxing the muscles, which tend most to displace the fracture. This is a matter of no small importance, and the profession must ever feel much indebted to him for what he has given to the world upon this subject.

I am aware that the limb can scarcely be placed in any one posture, which would not, by relaxing some of its muscles, produce a degree of tension in others; and though Mr. Pott has stated, in round terms, that the limb is to be placed in such a manner "as shall relax the whole set of

muscles belonging to or in connection with the broken bone," and in another place, "all the muscles of the limb," yet I am disposed to think, that his expressions upon this subject should not be taken in their literal sense,—that he could not have been ignorant of the impossibility of relaxing all the muscles of a limb at once, by placing it in any one position; and therefore would naturally have taught, would naturally have directed us, as a principle of treatment in these cases, to relax, as I have above stated, all those muscles which tend most to displace the fracture.

In a case of fractured thigh, Mr. Pott's practice was to place the limb upon the side, on a short splint; but this method is open to several objections. The skin pressed by the weight of the lower part of the body, between the great trochanter and the splint, soon becomes tender, and frequently inflames and ulcerates. The patient, to relieve himself from an irksome and painful position, turns upon his back; hence arises eversion of the foot, and consequent deformity. These effects are not constantly, but frequently occasioned by this mode of treatment.

The fracture box and the inclined plane, which is a simplification of the fracture box, are certainly improvements in the treatment of these accidents. Supposing the limb to be placed in the erect position, the fractured ends of the bone would be drawn in opposite directions; the upper forward by the action of the flexors of the thigh; the lower backward by the action of the gastrocnemius and popliteus; therefore, by placing the limb upon an inclined plane, we gain three points of evident advantage:—we weaken and resist the action of those muscles which tend to displace the lower fragment; and, by bringing up the limb upon the pelvis, we relax, and consequently weaken the action of the iliacus internus and psoas magnus, and place the patient in a position most easily maintained.

But there are some objections to the use of these instruments, which must not be passed over in silence.

The fracture box and inclined plane are mounted upon

wide frames, which prevent them from sinking into the bed upon which the patient lies. It is not so, however, with the nates. These and the trunk, by their gravity, cause the bed to yield, and in proportion as this gives way, the upper part of the thigh is forced against the corresponding end of the instrument, which, from this cause, occasions pain, tumefaction, and sometimes abscess. Again, in a case of fractured thigh, when the patient uses the bed-pan, the upper fragment, following the direction of the pelvis, is raised from the instrument, and motion is produced in the site of fracture. Are not these indications which point out most clearly, that any machine made use of for fractures of the leg and thigh should be entirely passive to the motions of the limb?

It has been said, that in fractures of the thigh it is sometimes necessary to apply extension, notwithstanding the limb is placed in the bent position. When this is required, I am disposed to believe, that the extending means should be made to act upon the lower end of the bone, or as near to it as possible;—not, however, by applying a ligature round the limb, but by some means which would bring down the lower fragment by acting upon a large portion of the thigh, or back of the leg.

To this plan I have not yet been able to discover any particular objection, and therefore think it preferable to extension in the straight position, to which the following may be started.

First, Its effects upon the natural curvature of the thigh bone, which ought to be maintained. Second, It increases the power of the muscles, which tend to produce displacement in the transverse direction. Third, It acts upon two sets of ligaments before the fracture is effected. Fourth, The natural figure of the limb forming curved lines in the inner and outer sides, is unfavourable to the practice.

The last of these objections may be easily got over by any means, extending from the pelvis to the foot, which would enable us to fix the thigh and knee, and at the same

time keep the leg and foot as much to the outer side of the line of the femur as is natural to the patient.

In the treatment of fractures of the lower extremity, other indications should be borne in mind besides those I have endeavoured to point out.

In consequence of high action, arising from contusion or other causes, it is sometimes advisable to place the limb high above the bed, and to lower it at pleasure without any danger of disturbing the fractured parts. This position favours the return of blood, and lessens arterial action. Further, it is proper that the limb should be fixed, so that the patient may have over it a sufficient power to place it, and to keep it in that position to which the trunk inclines.

Indeed, in the treatment of these or any other affections, we should use our utmost exertions to avoid all those circumstances which retard the cure, or render it imperfect, and avail ourselves of all those indications which reason and experience teach us contribute to a favourable result. For the treatment of fractures of the lower extremity, there is no contrivance that I am aware of hitherto given to the world which is capable of effecting these purposes; therefore, any machinery which could be made to avoid the one, and at the same time embrace the other, would, in my humble opinion, add much to the success of our practice, and to the ease and comfort of the patient during a long and tedious cure.

From what I have endeavoured to point out, I think it will appear, that, in the construction of any machine for fractures of the lower extremity, the following indications should be borne in mind.

1. It should fix the whole limb, so as to admit of no motion whose centre is not in the hip-joint, or between the pelvis and the back.
2. It should maintain the fractured ends in a natural position, and in perfect coaptation.
3. It should lie upon the limb with ease to the patient.
4. It should enable the surgeon to place the limb at any angle the case may require.
5. It should allow of the application of

extension and counter-extension, when the limb is in the bent position. 6. It should be entirely passive to the motions of the limb, and should allow the patient to place it in any position most congenial to his feelings, either on the heel or on the side, and to alter this position at pleasure. 7. It should enable the attendants to move the patient from place to place, without any danger of displacing the fractured ends. 8. It should allow of being adapted to limbs of different lengths and different sizes. 9. It should be applicable to fractures in any part of the limb, and of all kinds, whether simple, comminuted, or compound. 10. It should be simple and easy of application. 11. With all these advantages, it should ensure to the patient a speedy recovery, and a straight and perfect limb.

To answer these purposes, I have made use of the following contrivance: To fix the limb, and to allow it to be bent and fixed at different angles, a piece of beech slightly hollowed out to receive the back of the thigh, thrown a little out of a straight line to answer to the natural curvature of the thigh bone, and gradually narrowed towards the lower end, was connected by means of a hinge-joint to another piece of beech slightly excavated to receive the calf of the leg, and gradually narrowed towards the lower extremity to answer to the natural form of the limb. From the situation for the calf to the inferior end, this piece was made a little concave, simply to prevent the pad upon which the limb is placed from shifting its situation. Both of these pieces were cut out of $1\frac{1}{4}$ inch board, and that for the thigh was left one inch thick for two inches from its lower end, for the purpose of receiving on each side a brass-eyed screw; and that for the leg one inch thick, and the same width for six inches from its lower end. A bit of beech, a little longer and wider than the foot, was cut out at one end to receive the leg-piece at right angles. This was intended for a foot-board. It was one inch long and one broad, where it lay upon the side of the leg-board; and as they lay at right angles, the receiving end of the foot-board and

the received part of the leg-piece were bored transversely, so that they may be fastened together by means of a bit of wire. That part of the foot-board which lay upon the concave part of the beech intended for the leg, was a little rounded off at the edge nearest its lower end, so as to give it a hinge-like motion in a direction from right angles over the lower end of the leg-piece.

To fix the pieces of beech intended to support the leg and thigh, and to allow of their being placed at different angles, I had a thin rod of steel, connected at one end by means of a hinge-joint to a short pillar of brass, fixed by screws to the middle of the back part of the leg portion. To the other end of this rod was fixed, by a hinge-joint, a brass foot about an inch and half long, and one-fourth thick, with a hole in its centre, a little narrower in the transverse than in the longitudinal direction; and another hole in its side, which traversed the one in the centre transversely. To the side of the brass foot was fixed a bit of brass, with a spring in the form of a flute key, and at that end of the key which answers to the part that stops the hole in a flute, was fixed a steel pin, which was made to pass into the hole in the side of the brass foot, and cross the hole in its centre. A narrow piece of brass, with five stays projecting from its surface, was fixed to the back of the thigh portion. Each of these stays was of the form and size of the hole in the centre of the brass foot, connected to the steel rod, and each had a hole transversely to the plate upon which they were arranged, large enough to admit the pin made to traverse the hole in the side of the brass foot. They were placed at a distance sufficient to allow the thigh-piece to be fixed to that intended for the leg, either straight or at right angles.

It will be seen, that by pressing the key, the pin attached to it, as above described, would be drawn out of the hole in the centre of the brass foot-piece, which could then be made to receive any one of the stays on the back of the thigh-piece; and, once received, we have only to take the

finger from the key, and the steel pin is forced, by the reaction of the spring, through the hole in the centre of the stay, and, consequently, the two pieces of beech may be fixed at any angle the case may indicate.

To prevent the effect of moisture upon the steel rod, it is advisable to have it coated with brass or tin, which may be easily done; but this is not required except for hospital practice.

But it is proper that the instrument should be applicable to limbs of different lengths. The thigh and leg-pieces must allow of being shortened more or less according to the length of the limb. To answer this purpose, as far as the leg-piece is concerned, a number of holes of one size should be bored, in a line transversely to the lower end of the leg-piece, and then we have only to draw out the wire which fixes the foot-board to that intended for the leg, slide up the former upon the latter, and fix them where we please.

The length of the thigh portion, however, is not so easily altered; but this may be done by a thin plate of brass the width of the thigh-piece, and five or six inches long, according to the size of the instrument. When hammered out to lie upon the hollow part of the thigh-piece, and turned off at its upper end, this plate had attached to it two thin plates or bars of steel, of its own length, and about half an inch wide. As much of one end of each of the steel plates as was equal to the thickness of the wood of the thigh-piece, was bent at right angles. They were then placed upon the back of the brass plate in the longitudinal direction, and the bent extremities united to it just below its upper end, and within half an inch of its sides. Having now placed the brass plate upon the wood, and the steel plates or bars behind it, I had nothing to do but unite the one to the other, through two long mortises in the wood, in such a manner as would enable me to slide the brass plate up and down, or fix it upon the wood at pleasure. To answer this purpose, two male screws were fixed to the lower end of the brass opposite the steel plates, and made to pass

through the mortises in the wood, and two corresponding mortises in the steel plates, upon which they were fixed by female thumb-screws. By means of the female thumb-screws, the brass plate could be fixed or made to slide upon the wood, so as to enable us to lengthen or shorten the instrument, according to the length of the femur; but this is not at all required, except for fractures of the thigh.

But legs are of different thicknesses, as well as of different lengths; one man may have a larger calf or a longer heel than another; and these should engage our attention. To enable us to adapt the same instrument to different degrees of thickness in the calf or length in the heel, we may make use of a leather shoe, open from the toe, with a wooden sole, suspended from the top of the foot-board by means of a strap and buckle. The strap should be fastened to the bottom of the wooden sole in a groove, and made to pass over the top of the foot-board, which should be furnished with a buckle near the end that comes in contact with the leg-piece, in order to receive it. The strap should be let a little into the top of the foot-board, that it may not shift its situation. The sole of the shoe should be confined closely to the foot-board by a strap and buckle passed round them. The same intention may be answered by making the sole of the shoe to slide in a groove in the foot-board, upon which it may be fastened by means of a thumb-screw. The leather of the shoe is intended to wrap over the instep, and to be confined upon it with straps or ribbons.

This shoe is intended to answer three indications; to raise the heel from the leg-piece, or lower it, as the case may indicate; to prevent any lateral or rotatory motion between the fractured ends of the bones; and to form an easy bed for the heel.

The whole of what I have described is necessary for fractures of the thigh; but for fractures of the leg the brass plate may be dispensed with.

Besides the parts I have mentioned, three common short thigh splints are required for fractures of the thigh; one on

the outer, another on the front, and another on the inner side of the thigh. The first should extend from the upper part of the great trochanter to the lower part of the outer condyle; the second from the great trochanter to the patella; the third should lie upon the triceps adductor femoris, and should extend from the pelvis to the lower part of the inner condyle. These, with the assistance of the thigh-piece, may be made gently and regularly to compress the muscles, and prevent any straps or tapes made use of to secure them from injuring the soft parts. The one placed upon the front of the limb answers another indication, that is, to resist the action of the flexors of the thigh.

For fractures of the leg, three short splints are also required; one on the outer, another on the inner side of the leg, running from the head of the tibia, or the condyles of the femur, to the sole of the foot. These differ but little from the common short splints for fractures of the leg. Each of them has a small hole at the lower extremity, which corresponds with one on the same side of the foot-board. They are a little narrower, and the holes for the ankles are made to answer to the situation of the malleoli, the one for the inner ankle being nearer the anterior edge of the splint than that for the outer. These splints steady the foot more perfectly, and enable the patient to lay the limb upon the side. The third splint, which is composed of half beech and half thin slips of deal, turned up a little at either end, is intended to lie upon the front of the leg. This prevents the upper fragment of the fracture from being at all displaced by pressure on the calf, and preserves the integuments on the shin from the action of straps or tapes.

I have used the instrument above described in a variety of cases, and have not yet been able to discover any thing material that militates against it. In confining the different splints upon the limb, I have made use of leather straps armed with buckles, in preference to tapes, as the necessary degree of pressure can be better and more easily regulated with the former than the latter, and as there is no danger of

their giving way. In order to fix them to the instrument or remove them at pleasure, I have usually had some studs put along the middle of the back of the instrument, and a strip of leather near each side, for the straps to pass under.

Having described the different parts of this instrument, we now pass on to its application. This is modified by the state of the soft parts and the situation of the fracture. The surgeon should bear in mind the principles of his science, and act up to them in every instance. If no particular angle is indicated by the nature of the case, the semiflexed position is the most easy to the patient, both in fractures of the leg and fractures of the thigh. Whether the fracture be in the leg or in the thigh, the limb should be placed upon the instrument as soon as possible after the accident, and this is the more necessary in proportion as the displacement is great or inflammation high; but as long as the irritation continues it is not advisable to apply the short splints upon the fractured bone.

In a case of fractured leg, before the irritation has subsided sufficiently for the application of the short splints, the limb should be put up in the following manner:—The surgeon, having procured an instrument, should fit it to the sound limb. The hinge which connects the leg and thigh-pieces should be placed immediately under the knee joint, and the foot-board brought up close to the foot. He should then superintend the construction of a pad, made thickest at the part which is intended to lie under the small of the leg, and long enough to cover the leg and thigh-pieces, upon which the limb is to be placed. A tape should be placed transversely upon the back of the foot-board near its loose end, under a strip of leather, placed there to prevent the tape from slipping down to the end of the leg-piece. The ends of this tape should then be carried from the sides of the foot-board, through the corresponding brass eyes connected to the sides of the thigh-piece, and left hanging. The instrument being now properly adjusted, two assistants should raise the fractured limb, one the foot, and the other

the upper fragment, while the surgeon places the instrument, properly padded, beneath it. The instrument being in a line with the limb, and the hinge under the knee, the assistants should be directed to lower the limb gradually upon it, and place the heel in the shoe. Then, having placed a splint upon the top of the thigh, and another on the inner side upon the triceps, two or three straps should be carried round the thigh, upon the splints, so as to make very little pressure upon the limb. One of the straps, drawn rather closer than the others, should pass over the condyles of the femur, to keep the knee from rising from the instrument when the limb is moved. The only use of the short splints placed upon the thigh in fractures of the leg, is to prevent the straps that fix the thigh upon the instrument from injuring the soft parts. The tape made to cross the loose end of the foot-board should now be drawn as tight as is comfortable to the patient, and tied upon its back. The tape is intended to keep the foot-board close against the sole of the foot, which should be left extended a little beyond a right angle with the leg. The leather of the shoe should now be laid over the instep and toes, and secured as close as the patient can bear it with ease. The limb being thus put up, the foot of the instrument should be raised, and the patient left upon his back, with the limb upon the heel. In this state leeches, cold lotions, &c. may be applied; the patient's bowels may be freely evacuated; he may have his bed made daily, &c. without any danger of disturbing the fracture, if care is taken not to turn the instrument to either side. As soon as the irritation is sufficiently got under, the short splints should be applied to the leg, and confined moderately close with two or three circular straps, taking care that the beech of the front one is placed upon the tibia. A tape should now be passed through the small hole in the lower end of each of the side-splints, and through the corresponding hole in the foot-board. These tapes should then be brought together on the back of the foot-board, and tied. The straps upon the thigh having been drawn a little closer,

the patient may be furnished with a sling, which should be fixed so as to act upon the heel of the foot-board and lower end of the leg-piece, and desired to get up and place his limb across a chair, or walk about at pleasure on crutches, with a caution not to move the limb but by means of the sling. The sling should not be taken off the instrument night nor day, during the period of cure, as it gives the patient perfect command over the lower part of the limb, and enables him to place it in any position he pleases.

For fractures of the thigh it is proper to make use of the apparatus for lengthening the thigh-piece, unless the instrument be made to the measure of the limb.

The instrument, with this apparatus attached to it, should be placed under the sound limb, and fitted to the leg and foot, as for fractures of the leg, and the thigh-piece should be regulated so as to reach from the bend of the knee to within half an inch of the tuberosity of the ischium. The pad should be made a little longer than the instrument, that it may fall a little over its upper end, and be thick enough at this part, when compressed, to fill up the space left between the end of the instrument and the tuberosity of the ischium. The surgeon should superintend the making of this pad; for it is of importance in two respects. If the thigh-part of the instrument be nicely adapted to the length of the thigh, it will tend to keep the broken bone of the same length as the sound one, by its pressure against the tuberosity of the ischium and upper part of the back of the leg; and if its upper end be sufficiently protected, it will not inconvenience the patient by its pressure upon the soft parts.

When there is much contusion or inflammation of the soft parts, the instrument, properly adjusted to the length of the sound limb, should be applied in the following manner:—Two assistants should raise the limb from the bed, while the surgeon places the instrument beneath it. The limb being placed upon the instrument, the foot-board should be properly fixed with the tape, and the foot secured

in the shoe, as described for fractures of the leg. A strap or two should then be passed round the leg upon the instrument, and a bit of splint padded and placed upon the shin. The leg and foot, being thus secured, and a long broad strap with a sliding pad attached to it, being previously carried between the steel bars and the brass plates, one assistant should keep the upper end of the instrument close against the back of the thigh, while the other, by extending from the knee, draws down the instrument, and with it the lower fragment, till the upper end of the instrument comes anterior to the tuberosity of the ischium, in the same manner as when it was placed on the sound limb. The surgeon having ascertained this point, and that the bones are in apt and proper contact, the broad strap placed at the upper end of the instrument should now be made to cross upon the front of the thigh, pass round the pelvis, and buckle.

This strap keeps up the instrument against the back of the thigh, and serves to connect it with the pelvis, and therefore the instrument and lower part of the limb are made to follow those motions of the pelvis which tend to disturb the fracture.

The whole length of the thigh is left bare, and little or no impediment is given to the circulation. The limb thus secured should be left resting on the heel, with the patient on his back.

As soon as the high action is sufficiently got under, which is usually in the course of two or three days, the short splints, properly padded, should be placed upon the limb, and secured with three or four straps. The broad padded strap previously passed round the thigh and the pelvis, should now be carried under the leathers or tapes usually placed upon the back of the short splints; made to cross upon the outer of these splints; and again pass round the pelvis, and buckle. This strap keeps the upper ends of all the splints close upon the upper fragment, and serves to connect them with the pelvis.

If the broken ends of the bone do not ride; and if the

fracture be not so high up as to prevent the upper fragment from being held firmly by the splints, the patient may now be allowed to place his limb upon the side or upon the heel, and alter the position at pleasure,—not by means of a sling, however, as in fractures of the leg, but by placing his finger under one of the straps surrounding the lower end of the thigh, and at the same time, taking care that the pelvis and the limb move together in the same direction.

During the cure, it is necessary that the surgeon should attend to two points particularly. He must see that the instrument does not ride over the tuberosity of the ischium. He must take care that the patient does not move the limb by the exertion of its own muscles, but by the assistance of his hand. The reason of these two directions will immediately appear. The riding of the instrument would indicate that the fractured ends of the bone over-lap; and if the patient attempts to move the limb, by its own powers, he would incur the danger of displacing the upper fragments; for the muscles surrounding the fracture are not of a texture capable of opposing much resistance to the lateral displacement, which their own contraction would tend materially to produce.

If further extension and counter-extension be necessary, which I am disposed to believe will seldom be the case, the patient should be placed on his back, diagonally upon the bed. Extension may be then made by a tape, which should be fastened to the brass eyes on the sides of the thigh-piece, thrown over a pulley at the foot of the bedstead, and made to suspend a weight sufficient for the purpose for which it was intended. The tape, before it passes over the pulley, should take the line of the thigh-part of the instrument, at whatever angle it may be placed, and whether it lies upon the heel or upon the side; it will therefore be necessary for the pulley to be suspended from the ceiling, the foot of the bedstead, a forked stick, or any other means suited for the purpose. If the stick be used, it should have a number of holes bored through it transversely, and should be cut down

the centre to receive the pully, which may then be fixed at any height, by a wire passed through it and the corresponding holes in the stick.

For fractures of the leg, the instrument applied in the manner above described answers every indication for which it was constructed ; and it has been found successful in every case of fracture of the leg and thigh for which it has been used.

Having described the instrument, and the different modes of applying it in simple fractures of the leg and thigh, which vary according to the situation and state of the injury, I need only subjoin a few cases, to show its superiority over the means in common use, as to the comforts of the patient, and the rapidity with which he obtains a perfect cure.

I was favoured by Mr. Travers with the treatment of the following case of fracture of the thigh :—

Case 1.—Thomas Barwick, æt. twenty-six, was placed under my care, December 17th, 1821, for a simple fracture of the thigh, across the middle. The injury was occasioned by the wheel of a cart which passed over the limb. Considerable contusion and tension followed the accident ; but the muscles were tranquil, and the fractured ends of the bone did not appear to ride.

I saw him the fourth day from the time of the accident, and applied the machine. He had his bed made directly after, and had it repeated during the cure as often as he wished ; and placed his limb in any position most congenial to his feelings, either on the heel or on the side, and altered this position at pleasure.

January 17th, he got up with the instrument on, and walked about on crutches, supporting his limb in a sling. At the end of five weeks from the time of the accident, the machine was taken off ; and at the end of six, the man was able to walk without crutch or stick, and had a straight and perfect limb. As there was still some weakness about the

muscles of the thigh, he was desired to steady himself a little longer with a crutch or stick.

He has since informed me, he was able to carry a sack of malt, the distance of fifteen yards, ten weeks after the accident.

Case 2.—I feel indebted to Mr. Key, assistant surgeon of Guy's Hospital, who kindly offered me the treatment of the following case:—

Mary Lovel, æt. forty-five, February 8th, 1822, slipped off the flag-stones, and, her foot twisting under her, she fell and broke the tibia and fibula just above the ankle joint.

Fourteen days after the accident, I saw her. The tension and pain were then very great, and the foot was lying in the extended position, where it was kept by the spasmodication of the gastrocnemii muscles, and the fractured end of the lower portion of the tibia threatened to come through the skin. I was informed, that the symptomatic fever had run high. She had been out of bed in a delirious state. Leeches, fomentations, and cold lotions had been applied, and had in some measure reduced the inflammation and tension.

The machine was now lightly applied upon the limb. 24th, The pain and tension having materially abated, the short splints were placed upon the leg, and the straps were drawn moderately tight, and the woman desired to sit up with her leg across a chair. In a few days she was able to walk about the room with the assistance of crutches. Three weeks after the application of the machine, the bones were found firmly united, and the limb was straight and perfect. The machine was now taken off, and she was desired to walk about the room with crutches, bearing lightly upon the foot at every step. In six weeks and two days she was able to walk without crutch or stick; but did not throw aside the crutches altogether till the end of the seventh week.

Case 3.—T. C. æt. fifty-five, March 28th, 1822, fell from the step of a carriage, and, his foot twisting under him, the tibia was fractured obliquely into the ankle joint, and the

fibula a little above it. He was put to bed with the limb upon the side. Ten leeches were immediately applied to the part, and the bleeding promoted by fomentation. 29th, The machine was applied, and the leg kept wet with sedative lotion. He had considerable symptomatic fever, which was removed by a strong purgative. 31st, The active inflammation having subsided, short splints were applied to the leg, and the man ordered to get up and put his limb across a chair,—April 1st, the fourth clear day after the accident. He was up yesterday, and has been walking about this morning with the assistance of crutches, supporting the limb in a sling, but not without considerable pain when the limb was hung down. The pain in the part soon returned to its former state upon placing the limb in the horizontal position, and in the course of a few days it became immaterial to him whether the limb was placed upon the floor or upon a chair. 13th, He was seized with a pleuritic attack, which confined him to his bed three days. 22d, The twenty-fourth clear day after the accident, the instrument was taken off, and the bones were found straight and firmly united. 23d, Soap plaster and a bandage being applied, he was desired to walk about with crutches, bearing lightly upon the foot at every step. Five weeks after the accident, this man was able to walk across the room without crutch or stick; but as he had not yet full power over the muscles of the leg, he was desired to steady himself with one or the other a little longer.

Case 4.—A lady of rank and fortune received a blow from the heel of a horse, as she was on horseback, on the lower part of her stirrup leg. The force fractured the fibula about two inches and half above its lower extremity, and the tibia an inch and a half above the point of the inner malleolus. Eight weeks after the accident, finding she had no power over the limb, she came to town to consult Sir Astley Cooper, and by his recommendation requested my attendance. The fibula was at this time united close to the side of the tibia, and the leg deformed in consequence;

but distinct crepitus and preternatural motion still remained between the fractured surfaces of the tibia. The machine was applied, and in five weeks and three days the tibia also was found firmly united. During the cure, the lady walked about with the assistance of crutches, carrying the limb in a sling; received company; or took an airing in her carriage at pleasure.

I might add other cases, but these are sufficient to show the utility of the instrument I have endeavoured to describe, and the validity of the principles upon which it was constructed.

In speaking of the mechanical treatment of fracture, it might have been expected that I should say something upon the use of plasters and bandages; but as it regards the treatment of simple fracture, I have nothing to add to the general plans which would prove interesting to the surgeon, or useful to the patient. What I have to say upon this subject will come in better with some observations I have to offer upon the great advantages which arise from the use of this instrument, in dislocations of the knee and ankle, compound fracture, and cases of non-union; but these I must reserve for a future period.

82, Great Surrey-street, Blackfriars-road.

[It is but justice to Mr. Amesbury to say, that many of his additions and corrections to this valuable paper were received too late for insertion; and we trust our readers will overlook any of the slight inaccuracies of expression, &c. incident to an unpractised writer, though an able surgeon.—ED.]

ART. VII. *A singular case of Priapism.* Communicated
by DR. JAMES MOORE, of Shelbyville, Kentucky.

MR. —, about 40 years of age, having been married about fifteen years, and in that time his wife had four or five children. Within the last twelve or eighteen months, he was affected with symptoms of hepatic derangement, accompanied with dyspepsia. For these complaints, he was

slightly salivated, and afterwards used the oxyde of bismuth, with the usual tonics in such cases. Under this treatment, with proper attention to regimen and exercise, his health and general strength were recovering very fast; during this state of convalescence, the following circumstances took place:

De morbi causa hæc, viro ipso narrata sunt. Recubante cum uxore suo et volente ea frui in coitu sed non facundare, subito in articulo seminis emissionis penem retraxit et emissio imperfecta ita extra vaginam facta fuit. Deinde se composuit ad somnum captandum. Tempus tamen dormiendi perbreve fuit. Cito enim resucitatus fuit erectione vehementer dolorifica; musculi erectores penis spasmodice affecti fuerunt, et totum membrum virile ita tumidum et durum fuit, ut urina, multa cum difficultate eredita sit. In hoc statu æger per dies viginti sex remansit, sine ulla, fere, intermissione.

The patient living about five miles from town, no medical assistance was had for about eighteen hours, when my partner, Dr. Nuckolz, was called to visit him. In addition to the symptoms above described, he was found with considerable fever, great pain and restlessness, the bowels costive, and some disposition to vomit. Blood was immediately taken from the arm in large quantity, then from the body of the penis itself, by cutting all the veins that could be found on its surface; the bowels were freely evacuated by the administration of an active cathartic; applications of cold water and vinegar, with acetate of lead, were used, and not finding relief from this, the warm bath was tried, but had a similar result; Dr. Nuckolz stayed with him all night, and I was sent for in the morning. Additional blood-letting, almost to syncope, was again had recourse to; local scarifications were recommended to be made, pretty freely, into the body of the corpora cavernosa, but to this our patient positively objected, and we were only enabled to repeat the opening of the superficial veins; leeches were prescribed, but it was impossible to procure these in this country,

at this season of the year, and indeed at any season they are very rarely to be had. The long continued application of bladders, filled with ice water, was suggested; but from the attempt already made with cold water, the patient complained of its increasing the pain; cloths wetted with the saturnine solution, he thought gave occasional relief, but not permanent; the parts were very copiously anointed with opium rubbed up in sweet oil; this relieved pain, but no abatement of the swelling; an aqueous solution of opium was injected into the urethra, through a catheter; this had no good effect. Nauseating injections into the rectum were tried, but without any other relief than that obtained from evacuating the contents of the rectum; these injections were made of tart. emet., sal. glb., aqua tepid, et ol. oliv.; blisters were applied to the ankles, to the inside of the thighs and perineum; these at first seemed to give relief, but it was of short duration. Several other physicians of the first respectability were called at different times, in consultation, but our united councils did not seem to promise much success, till it was again determined to make a full and complete trial of the cold water; indeed this expedient would have been more forcibly urged from the commencement, had it not been for the previous diseased and debilitated state of the system; but as a dernier resort, it was now determined to make a full experiment; accordingly five large bladders were procured, and these filled with the coldest water that could be had, for although it was the month of February, there was neither ice nor snow; the coldest water was from a branch, which was from 36° to 38° of Fahrenheit. These were applied alternately, sometimes two, and sometimes three, and changed as they became warm; this was continued with but little intermission for three days, before any effect visible was produced. About the end of the third day, manifest relaxation was had, and in about twenty-four hours longer, the relaxation was complete. About the time of this taking place, a glary mucus was discharged

from the urethra similar to the discharge in seminal debility.

The priapism had continued without intermission for twenty-three days before the last application of the bladders, and about the end of the twenty-sixth day the relaxation was complete: during the whole of this time, the patient said he was not conscious of having slept, but experienced occasional interrupted dozes. Poultices of stramonium, cicuta, and hyocyamus, in decoction, were recommended, but these could not be procured; a poultice of humulus lupulus was tried, and also the common mucilaginous poultices, but he thought they were rather injurious, on account of their weight, and increasing the heat of the parts. It was found necessary, during the whole of this case, to give cathartics and enemata largely, and continually, as more relief was obtained from free alvine evacuations than any other remedy. The patient enjoyed pretty good health for a short time, but again seemed to relapse into the old cachectic and dyspeptic state, with a pretty general diseased state of the internal glands; he is now again recovering, and promises to enjoy tolerable health.

ART. VIII. *Observations on the Good Effects of Oil of Turpentine in Puerperal Fever.* By HENRY PAYNE, M. D. Nottingham.

(From the Edinburgh Medical and Surgical Journal, No. 73, p. 538.)

DR. CAMPBELL, in his Observations on the disease usually termed Puerperal Fever, published in the Edinburgh Medical and Surgical Journal, for April 1822, says, "that it becomes the duty of every practitioner, who may have been at all successful in treating it, to communicate the results of his practice to the profession." It is in compliance with this maxim, that I feel myself called upon to state the result of the experience I have had in the management of this disease,

which has been attended formerly with so much fatality. Indeed the puerperal fever has, within the last fifteen years, raged with its usual violence in many parts of this kingdom, and particularly in the West Riding of Yorkshire, when but very few of those attacked by it escaped. Before the publication of Dr. Brennan appeared, recommending the oil of turpentine in puerperal fever, I well recollect that the practice of blood-letting was usually had recourse to; but, as far as my own observation went, there was certainly less success attending it than appears to have followed the application of the same remedy in the cases detailed by Dr. Campbell. After reading Dr. Brennan's work, I was glad to try a fresh remedy for puerperal fever, because I had seen so little good result from venesection, which, although it was, in the practice I had an opportunity of observing, used early in the disease, and carried to as great an extent as was practised by Dr. Campbell in the cases he has favoured the profession with, not more, to the best of my recollection, than one patient was saved, who appeared to get well, as the saying is, "in spite of the Doctor." It is now nearly eight years since I was called to visit a female who laboured under this disease; when the surgeon, who had only seen the patient a short time before, (she having been attended in labour by a midwife,) proposed the exhibition of the *oleum terebinthinæ*; which was assented to, and it was given in doses of half an ounce every two hours. The effect was a very copious discharge from the bowels, appearing to consist of serous fluid tinged with green, in which were seen floating numerous pieces of white matter, like coagulable lymph. Soon afterwards, the patient became maniacal, and continued so for several days, when her intellects were restored, and she gradually recovered. Since that period, I have seen many cases of puerperal fever, one of which had been attended some days by a surgeon, who had discontinued his visits. I believe she was not bled. The friends of this patient, seeing that I had an unfavourable opinion of the case, called in a more experienced physician, and it was agreed to

try the turpentine as a last resource. Two drachms of it were prescribed every two hours, which soon brought on a purging, of a matter of the like nature as before mentioned. I stated, that in one case mania had taken place after the exhibition of the turpentine, which was probably given in too large doses, thereby producing a determination to the head; two drachms were therefore agreed to be given, and the physician in attendance with me, a gentleman of long experience, and in great practice, I well recollect, said, that it was an unfortunate circumstance that the turpentine had not sooner been thought of, for if it had, great numbers of females might have been saved.

Although this patient was in *articulo mortis* at the time of the exhibition of the turpentine, she recovered very quickly; and the same success has attended the treatment with turpentine of every case of puerperal fever that has within the last seven or eight years fallen under my care. It appears to be somewhat extraordinary, that no mention of the turpentine is made in Dr. Campbell's cases. I think I can venture to assure that gentleman, that if he will try this remedy fairly, no matter whether it be early or late in the disease, his practice will be accompanied with more success, and that instead of losing four patients out of fifteen, he will find they will all recover. I am anxious that the experience I have had in the treatment of puerperal fever with turpentine should be made known, because I tremble for the consequences that are likely to happen from the use of the lancet, so strongly urged by Dr. Campbell. I agree with that physician, that the disease in question is of an inflammatory nature; but do not think with him, that women in childbed are able to support the loss of blood better than on any other occasion. I believe they are then less able to bear it; and my experience teaches me to believe, that bleeding is not at all necessary in the disease called puerperal fever, however severely the system may be excited by it. Whether early or late in the disease, the turpentine, when properly administered, avoiding at the same time every thing

that is likely to prove irritating, will effectually remove every symptom of the complaint, which it appears to do, by augmenting the secretions into the intestines, to an extent proportionate to the amount of the inflammation, whether affecting the uterus and its appendages, or the peritoneum. The bowels are as quickly and as powerfully excited to action by the turpentine as the vessels which open into them; and the profuse discharge that takes place does certainly, according to the experience I have had in puerperal fever, more quickly and effectually relieve the patient of her sufferings, than either bleeding or any other remedy. If the turpentine, as it appears to do, caused a vast secretion of fluid and lymph into the bowels, is it not, by this operation, likely to relieve the inflamed vessels of the neighbouring parts of great part of their contents; and will they not therefore be as efficiently emptied as if local bleeding had been applied? The immense discharge from the bowels, by the use of the turpentine, never occasions those secondary symptoms that I have seen follow the extensive use of the lancet, which are even more to be dreaded than the disease itself, one of which is a sort of agitation of the vascular system, such as I cannot describe; during the continuance of which, I am of opinion, those effusions take place into the cavity of the abdomen, which are almost invariably followed by death. The enlarged state of the abdominal nerves, as observed by Dr. Campbell in his dissections, is an important discovery, and proves that that part at least of the nervous system had been greatly excited; and, notwithstanding "the superabundance of blood that may be circulating in the system after parturition," this discovery will teach me to prefer the turpentine in puerperal fever to bleeding,—a remedy which, there is much reason to fear, will aggravate that affection of the nerves, that gives rise to symptoms which it is out of our power to control.

Nottingham, July 16, 1822.

ART. IX. *Mémoire Physiologique sur les Maladies Purulentes et Putrides, sur la Vaccine, &c.* Par B. GASPARD, M. D.—*Journal de Physiologie, &c.* Par F. MAGENDIE, Membre de l'Institut. Jan. 1822.

(From the London Medical Repository, No. 102, p. 509.)

THE very interesting experiments made by this ingenious physician, in order to ascertain the action of the animal fluids, when introduced into the circulating system, in their natural, diseased, and decomposed state, are calculated to throw considerable light on the nature of a number of diseases. The novelty of such inquiries, but more especially the importance of the results which M. Gaspard has obtained from them, demand a full, but condensed detail of his observations.

Exp. 1.—On the 6th of September, 1808, M. Gaspard injected into the jugular vein of a middle-sized dog, about two drachms of white, coherent, fetid pus, procured from a large common ulcer, and mixed with a little water, to diminish its viscosity. The animal, at the moment of the injection, became agitated, and went through the action of swallowing. He whined, appeared weak, and vomited more than six times in the course of the day. An hour after, there was an evacuation of excrements, and of thick, troubled urine, which gave a little relief; however, towards the evening, he was very sick, lying on his side, with the legs stretched out, the respiration insensible, and the pulse very weak. Ten hours after the experiment, he passed blackish, liquid, and extremely fetid stools, which brought about an immediate relief, and a quick recovery. The animal regained its appetite, and on the following day was quite well.

Exp. 2.—“On the 8th of September, I injected into the other jugular vein of the same dog nearly three drachms of the same pus; and after some time there came on, as in the first case, weakness, vomitings, frequent evacuations of

urine; and twelve hours after the injection, liquid stools, whitish, very fetid, and frequent. Death supervened within twenty-four hours, preceded by additional excretions. On opening the body there was no perceptible alteration of the intestines nor of the other organs."

Exp. 3 and 4.—The first was made on the 15th; the second on the 18th of September, on the same dog. In the former he recovered, after frequent evacuations, from symptoms similar to those already described. In the latter experiment, death was occasioned. *Dissection.* The inferior portions of the lobes of the lungs were inflamed, and nearly hepatized. No other lesion was observed.

Exp. 5.—Three drachms of recent pus were injected by the jugular vein of a small, lean, and nearly scorbutic dog. In three minutes, vomiting, expulsion of urine, tenesmus, and violent rigidity of the limbs, came on. Increased vomiting; frequent, liquid, and very fetid evacuations afterwards supervened; and at the end of five hours, the animal died, under an agony of tormina and tenesmus. *Dissection.* The intestines appeared thickened externally. Their mucous membrane was inflamed and swollen, especially in the colon and rectum.

Exp. 6.—On the 21st of September, M. Gaspard threw into the veins of another dog, middle-sized, but robust, half an ounce of the same pus, a little older, and more putrid than that used in the foregoing experiment. But about as soon after, the animal, as the others, had vomiting, with violent efforts, which brought away excrements, solid and moulded, as if in the ileum; afterwards, frightful nervous symptoms; wandering vision; excited sensibility; involuntary gambols of the whole body; convulsive attacks, followed by faintness; hiccough; painful and short howls; staggering walk, without any apparent object; a kind of furious delirium; then burning thirst; dyspnœa; beating of the heart, which vibrated and sounded through all the chest, &c. supervened. This state continued about a couple of hours; and the dog expired in dreadful convulsions, without hav-

ing critical evacuations. *On opening the body*, which was still warm, the venous blood was very coagulable, not allowing the serosity to separate by standing. The pericardium contained a little effused serum. The left ventricle of the heart was thickened and inflamed; it presented, upon its inner surface, spots of the colour of wine lees, formed by a kind of pellicle, which disappeared only after rubbing and continued washing. The other organs appeared healthy.

Exp. 7.—The 18th of September. About two drachms of pus were introduced, by the serous membrane of the testicle, into the abdomen of a little dog, without producing violent pain; but soon after, vomiting, with violent efforts, evacuation of urine, fever, and dyspnœa, came on. After three hours the abdomen was convulsed, drawn in, and very painful upon pressure, as in peritonitis; and death ensued twelve hours from the time of the injection. *The body, being opened*, presented a reddish peritonæum, rather inflamed, and containing more than an ounce of bloody, inodorous serum. The mucous membrane of the intestines was rather red and inflamed.

Exp. 8.—Was a repetition of the former. The animal died in twelve hours, after the same symptoms as described in the last experiment. *Dissection.*—The peritonæum was inflamed: it contained a small glassful of sanguineous serum, of a fetid odour, suspending albuminous flocculi, which adhered to this membrane. The mucous coat was a little inflamed.

Exp. 9.—On the 28th of September, M. G. injected pus into the left pleura of a little bitch. It was followed by a painful oppression of the respiration, with apparent pleurisy. However, twenty hours after, the symptoms being less intense, and death not appearing likely to follow, he killed the animal.—*On inspection of the body*, he found, in both cavities of the pleura, which was inflamed, and covered with albuminous flakes, a sero-sanguinolent, inodorous fluid. The lungs were sound.

Exp. 10.—On the 28th of September, 1808, M. G. introduced some pus into the cellular texture of a dog. It was not apparently absorbed. It caused, however, a hard inflammatory tumour that terminated in an abscess.*

* M. Gaspard draws the following conclusions from the ten foregoing experiments:—

1. Pus introduced into the circulation in small quantities, causes considerable functional derangement, from which the animal recovers, after it has been expelled from the economy by means of a critical excretion of urine, or of faecal matters.

2. When introduced at successive periods in the same animal, it produces death.

3. When injected into the veins in a large dose, it produces severe inflammation; namely, peripneumonia, carditis, dysentery, &c.

4. It appears susceptible of being absorbed, causing at the same time inflammation of the serous membrane and cellular tissue, with which it had been placed in contact.

5. The majority of symptoms occurring in hectic or phthisical fevers, appear to admit of being referred to the presence of pus in the circulation.

M. G. also infers, that the phenomena which are manifested in the course of cancerous ulceration, old dropsies, mercurial ptyalism, gangrenous affections, drunkenness, and in consequence of various ingesta, or aliments, may be attributed to the absorption of a portion of them into the blood. The author farther proceeds to remark, that the presence of pus in the circulation, giving rise to similar derangements in the secretory functions with those evinced in his experiments, has been proved by the pathological observations of Kerckring, Holler, Sulp, Cornax, Bonet, Storck, Laennec, and J. F. Meckel. "But," he adds, "in all these cases, the pus must necessarily have circulated for a considerable period with the blood, without producing a speedy death: it appeared to have acted by inducing the hectic phenomena which terminate in the destruction of the patient." M. G. considers that absorption frequently takes place in various diseases characterized by suppuration, either through the medium of the veins, or of the absorbents, or of both. Although absorption was not established in the 7th, 8th, 9th, and 10th experiments, still it appeared very probable, from the appearances observed after the injection of the pus within the pleura and peritonæum. In these instances, the fetid odour disappeared, and inflammation of the mucous membrane of the intestines supervened. Experiments 18, 19, and 20, about to be given, will farther confirm the opinion of the author. He adduces, in addition, the observations of M. Baumes, who found pus in the larger absorbents coming from the mesenteric glands, which were in a state of suppuration; those of M. Magendie, who had detected it in the veins; and those of M. Portal and Dupuytren, who observed this fluid in the lymphatics, in the vicinity of large abscesses.

M. Gaspard's intention, after having made the foregoing experiments, was to perform others with different kinds of

We consider it no easy matter to prove that the contents of lymphatic vessels are or are not pure pus; and it is still more difficult to show that pus forms even a part of the matters which they contain. The author's arguments, derived from the symptoms which supervene to the disappearance of certain eruptions, especially of small-pox, may be viewed, either as corroborative of his opinions, or disproving them, according to the light in which they are held. Because, if the pus be absorbed at once, and in abundance, into the circulation, without having experienced, during its route, any change or assimilation in the various vessels and glands through which it has passed, we may readily grant, that grievous derangements will be induced in the system. If, however, such changes be considered actually to take place, the absence of any great constitutional disturbance may be explained, while the absorption of the morbid secretion is at the same time allowed. It must not be overlooked, during our speculations on this interesting subject, that not only are changes going on in the matters which are absorbed, which appear to dispose to that process; but that certain portions of such substances are taken up by the vessels, to the preference, or to the entire exemption of other portions; and that even when arrived in the circulation, either directly, or by the circuitous route of the lymphatics and glands, if they are not sufficiently assimilated in their course, they are eliminated from the blood by the secreting organs. There is no doubt, but it is during the secreting process that the extraneous matters in the blood disorder the operations of these organs, and even induce structural derangement. Hence the phenomena which appear towards the advanced stages of many diseases are evidently the result of disordered functions; which state, indeed, constitutes the commencement of all ailments. If one organ is impeded in its office of ridding the economy of certain noxious materials, and not vicariously supplied by any other, such materials must therefore accumulate, and become a source of irritation throughout the system; but more especially to the organ, whose function it is to eliminate them. Thus, if from certain causes, which may be demonstrated, the elements entering into the composition of the bile abound in the system, a source of disorder or of irritation is present in the blood. This irritating cause must operate upon those parts which are sensible to its action, and to which it is incessantly and immediately applied. Derangement of the whole vascular system becomes the consequence of such irritation offered to the nerves ramified upon the heart and blood-vessels, but more especially in the organ destined to combine and to secrete, under new forms, the materials now so abundantly presented to it; and hence all the phenomena of bilious diseases and bilious fevers will be produced according to the varying circumstances by which an individual may be influenced, or which may characterize the disposition of his system at the time. Other derangements in the secreting

pus, especially with that of gonorrhœa, syphilis, cancer, variola, and vaccinia. But, circumstances not having allowed him, he only made the three following with the vaccine matter:—

Exp. 11.—On the 5th of November, 1817, the author threw into the jugular vein of a young sheep, which had never been vaccinated, nor subject to the rot, an ounce of cold water, in which he had dissolved six vaccine crusts, taken off, some hours before, from the arm of a child, and to which he had added a large drop of vaccine matter from a vesicle at the eighth day. But on the introduction of this liquor, which was viscous, troubled, yellowish, and of a stale smell, the animal went through the act of swallowing, without giving evidence of pain. It afterwards did not appear affected, suffered no lesion of the functions, and preserved its appetite and vivacity; there followed no eruption of pimples on the skin; and the wound healed very well.

Exp. 12.—The 27th of October, 1820, M. G. injected by the jugular vein of a little bitch, four months old, which had not had what is called the *maladie des chiens*, half an ounce of water, in which were dissolved, by a maceration of some hours, four vaccine crusts; and in which he had also soaked a thread, impregnated, the same day, with fluid virus. An hour after only, the animal was affected by this injection, refused food, and vomited. The vomiting was renewed afterwards more than ten times, with burning thirst, evacuations of urine, and uneasiness, which lasted all the day; but on the morrow, there was a complete recovery, return of appetite, and no vaccine eruption appeared.

As pus is an animal substance which is partly putrid, it was proper to ascertain whether its action upon the system depended upon its putrid qualities, or upon some other peculiar property. In order, therefore, to compare its effects

functions could be adduced, in illustration; this one will, however, be sufficient to place our proposition in an intelligible point of view.—EDITOR.

with those of putrid sanies, he made the experiments which follow :—

Exp. 14.—“ On the 18th of June, 1809, I injected, by the jugular vein of a little bitch, half an ounce of the sanies, or fetid liquor, proceeding from the simultaneous putrefaction of beef and dog's blood. At the moment even the animal went through the act of swallowing several times, and soon after had dyspnœa, uneasiness, and faintness. It lay on its side, refused food, and soon passed excrements and then urine. But after an hour there came on prostration of strength, gelatinous, bloody and frequent stools, dysentery, and redness of the conjunctiva; afterwards pain of the breast, and of the belly upon pressure, gradual loss of strength, bilious, gelatinous, and bloody vomit, and death three hours after the injection supervened. *On opening the body*, when yet warm, the lungs were inflamed in a peculiar manner, or rather congested. They had a violet or blackish colour, with many ecchymosed spots, or petechiæ, which were found also in the substance of the left ventricle of the heart, the spleen, the mesenteric glands, the gall-bladder, and also in the subcutaneous cellular membrane. The peritonæum contained some spoonful of reddish serum; but the mucous membrane of the digestive canal was principally affected. That of the stomach was somewhat inflamed; in the intestines, and particularly the duodenum and rectum, it was considerably so, with a livid colour, black spots, and a bloody, gelatinous covering, like wine-lees, or the washings of meat. This inflammation was also accompanied by slight thickening of the membranes, and a hæmorrhagic or scorbutic appearance.”

Exp. 15.—“ On the 10th November, 1820, I repeated the preceding experiment, throwing into the jugular vein of a pretty large dog an ounce of a thick reddish fluid, procured by macerating and digesting in water a little flesh of beef already fetid. The animal was scarcely untied when it passed liquid stools, very fetid, with a quantity of urine; there were frequent efforts to expel the foul matter, hurried

and deep respiration, a small quick pulse, loss of strength, position on the side, and want of power to stand. After an hour came on tenesmus, with a kind of diarrhœa, or dysentery, marked by liquid, bloody, sanious, and fetid stools, which continued till death, which took place two hours and a half after the injection. *On opening the warm body*, the lesions were the same as in the preceding experiment. The lungs were marked in a similar manner with black, brown, or livid spots, as large as a *centime*, the intestinal canal filled with mucous and bloody dysenteric sanies like that in the stools, and the mucous membrane of the intestines equally red, livid, and of a hæmorrhagic or scorbutico-inflammatory look."

Exp. 16.—"The 14th July, 1821, I injected into the jugular of a middle-sized dog two ounces and a half of a fetid, thick, but not acid liquid, produced from the putrefaction of cabbage leaves, kept during two days at a temperature of twenty degrees of R. in an equal quantity of water. Copious stools, of a liquid, fetid and soot-coloured appearance, analogous to the dejections of *melæna*,* supervened in the course of nine hours, accompanied with vomiting and difficult respiration.

15th.—"Great prostration of strength, a small and febrile pulse, ardent thirst, and paroxysms of palpitation of the heart were very apparent."

16th.—"The symptoms were less violent; thirst, fever, want of appetite, and occasional vomiting of his drink, were however present."

17th.—"His state was the same."

18th.—"The symptoms were aggravated. He died the following night on the fifth day of the experiment. *Dissection.*—Slight phlogosis was observed in the mucous lining of the bronchiæ. The left ventricle of the heart presented several brown ecchymoses, which dipped into its substance.

* Several of the phenomena of yellow fever may be here recognised.—
EDITOR.

An albumino-fibrinous concretion, of a yellowish-white homogeneous appearance, weighing two drachms and a half, filled in part the right ventricle. It was detached in the ramifications which it extended into the pulmonary artery, the superior vena cava, and venæ axygos, axillaris and jugularis dexter. It adhered only to the ventricle by a surface of a nail's breadth, which possessed an inflamed and torn appearance. The mucous membrane of the intestines, especially of the duodenum and rectum, was inflamed in longitudinal streaks, and without any thickening of its texture, or ulceration. It approached in some places the character of ecchymosis. The mucous glands were swollen, and very apparent."

Exp. 17.—M. Gaspard, on the 21st September, 1821, injected very slowly into the jugular vein of a small dog an ounce of the fluid produced from the putrefaction of the stalks and leaves of white beet. Want of appetite, agitation, vomiting, and shortly afterwards dejections, at first soft, but subsequently liquid and mucous, supervened. Dysenteric evacuations, bilious vomitings, pain of the abdomen on pressure, and consecutively sanguineous, fetid, black fuliginous stools, similar to those of *melæna*, augmented the sufferings and exhaustion of the animal, and destroyed it eleven hours after the injection.—*Dissection* was performed while the body was yet warm. The lungs were engorged, but presented neither ecchymosis nor petechiæ; the heart and stomach were without lesions; the gall-bladder was ecchymosed; the intestinal canal, from the pylorus to the anus, was covered by a mucoso-sanguineous liquid, similar to wine-lees; but nevertheless the mucous membrane was nearly healthy, unless in the duodenum, rectum, and commencement of the jujenum, where it was of a violet-red colour, and slightly inflamed in longitudinal streaks.

M. Gaspard considers that these two experiments show that the putrid matter of vegetables acts upon the system, as that of animal substances, but in a less degree. He pro-

ceeds next to mention facts which are of his own observation, relative to their absorption.

Exp. 18.—"The 28th July, 1821, I threw into the subcutaneous cellular tissue, in the inguino-abdominal region of a little dog, about three ounces of putrid liquor, in which had remained, for one night, a little raw meat corrupted and slimy. The animal evinced great pain on each injection, refused food, and became agitated, rolling upon the ground, uttering cries, and having the belly painful to the touch. Some hours after a local cellular tumour arose, which was hard and painful.

"On the 29th. The same condition; and anorexia, with the abdomen retracted, and the swelling painful, shining, emphysematous, and looking gangrenous along the penis and about the groin, with the eyes red and suffused.

"On the 30th. Towards the evening, sixty hours after the experiment, rupture took place of the tumour, which had become gangrenous, with discharge of black and putrid sloughs, leaving exposed the penis and abdominal muscles; the eyes were full of humour as before.

"On the 31st. Convalescence, and return of appetite, were apparent; the eyes nearly free from rheum; the belly not very painful; and the wound, which the animal cleaned with its tongue, well conditioned.

"Upon 1st of August. Recovery was more evident; the appetite almost natural; the eyes clear; the wound red, but with great loss of substance. After this the health returned, and in four days the recovery appeared complete, except that the wound filled rapidly with large fleshy granulations. The dog was then submitted to the following trial:—"*

Exp. 19.—"On the 5th of August, 1821. In the morn-

* M. Magendie attributes the different effects produced by the injection into the veins, from that arising from injection into the cellular tissue, to the deficient vascularity of this substance, and to the inflammation of the capillary veins, induced by the presence of the injected fluid, preventing or diminishing their faculty of absorption.

ing I injected, in ten throws, into the peritonæum, five ounces of a corrupted liquor, procured from blood and beef-flesh fermented in water for forty-eight hours at the temperature of thirty-five R. On each injection, the animal uttered cries, shook about, and passed nearly every time a great quantity of limpid inodorous urine, which was certainly not that accumulated during the night, and contained in the bladder. After the experiment all aliments were refused; there came on vomiting, alvine excretions with painful efforts, weakness, lying upon the belly, which was sensible to pressure. An hour after this, vomiting and purging recommenced, and were from this time frequently repeated; the stools became mucous, gelatinous, and dysenterical. The large wound produced by the former experiment now assumed a scorbutic and spotted lividity; the slightest pressure on the belly occasioned convulsive cries; motion was painful to the animal, it therefore walked unsteadily. At last, dyspnœa, continued tenesmus, and death, came on nine hours after the injection. *On opening the body*, about a bottle of bloody serosity, inodorous, and of the colour of wine-lees, was contained in the abdominal cavity. The peritonæum was inflamed, of a purplish red, and as it were ecchymosed over all its surface. The inflammation was excessive, with black spots and extravasated blood all along the mesenteric vessels, and in the concave curvature of the intestines, where they penetrate between the duplicature of the peritonæum. All the mucous surface of the digestive canal, from the cardia to the anus, was uniformly much inflamed, particularly in its folds, and of a deep red, inclining to violet, or blackish; but that of the stomach was only inflamed in its folds. The intestinal canal contained a gelatinous mucus without blood; the muscular coat did not partake of the inflammation of the two others; the bladder was empty, contracted, and inflamed on the exterior, and very white within; the pleura of the left side contained, like the peritonæum, a red and bloody serum; the spleen and the lungs were spotted with stains, or ecchymosis; and, lastly, the wound, which before the injection was covered

with red pimples, had a blackish look, as if it were scorbutic, or gangrenous."

The 20th experiment, performed by M. Gaspard, was a repetition of the former. It furnished nearly the same results. M. G. considers that the three experiments which have been just related, viewed in connection with those made with pus, prove in a satisfactory manner the absorption of putrid substances. We are not so positive, however, of this as he appears to be. The experiments and arguments which he has adduced, are certainly much in favour of the occurrence, although they do not unequivocally prove it to be a fact. The following are the arguments which he has offered upon the subject:—

1. The symptoms resulting from their injection into the peritonæum are very similar to those arising after they have been thrown into the veins.
2. Although injection into the former tissue produces violent symptoms locally, still derangements supervene in different and in remote organs, which can only be explained by considering the process of absorption to have taken place. Such were remarkable in Experiment 16 and 18, where the secretion in remote organs became abundant, unusual in appearance, and puriform. In Exp. 7, 8, 19 and 20, where the mucous membrane of the intestinal canal was violently inflamed, yet the substance between it and the inflamed peritonæum presented no such character. The other proofs on which the author rests his arguments, are:—1. The copious secretion of urine which always followed the injection, arises, as he supposes, from the absorption of the liquid in which the irritating substances were dissolved. We should suppose that the first evacuation would result from the irritation of the peritonæum inducing contraction of the bladder.
2. The absence of the odour, and sensible characteristics of the putrid substances injected into the peritonæum, in the fluid which that membrane has been found to contain after death.
3. The derangements observed in the lungs, pleura, spleen, &c.

M. G. goes on to remark that the general effect upon the

animal system, arising from putrid substances introduced into the circulation, either by injection into the veins, or by absorption, appears to be a peculiar kind of inflammation, accompanied with a species of hæmorrhage of a passive nature, taking place from the mucous membrane of the intestinal canal. As, however, both animal and vegetable substances, in becoming decomposed, give out carbonic acid, hydrogen, sulphur, and ammonia, it would be well, he adds, to know which of these substances has caused the effects which he has observed. The following experiments, he thinks, may in some measure illustrate this obscure subject :

Exp. 21.—"The 26th July, 1812. I threw into the jugular vein of a little dog an ounce and a half of water which had boiled, shaken up strongly and frequently for several days, with an equal volume of carbonic acid gas, procured from the decomposition of carbonate of soda, by sulphuric acid. Some minutes afterwards the animal vomited, and this was repeated four times, and with violent efforts, during three hours ; there were also two stools, the first soft, and the second quite liquid. To these evacuations succeeded, during two hours, a state of great weakness, sluggishness, somnolency, with harsh and uneasy respiration ; but five hours from the injection, the dog, after passing a great deal of urine, became better, recovered its appetite, and was soon perfectly restored."

M. Gaspard performed *Exp. 22*, upon a young fox. The result was almost similar.

Exp. 23 and *24*, were repeated on large dogs, with a less quantity of the carbonic acid. The effects were very slight ; indeed, scarcely any derangement of function was observed to follow.

Exp. 25.—"March 24, 1816. I introduced into the vein of a middle-sized dog, half an ounce of sulphuretted hydrogen, liquid and clear, very fetid, and readily blacking silver, giving off bubbles of inflammable air at its surface, preventing the development of frogs' spawn, as well as the vegetation of onions, and obtained by the maceration and digestion

of sublimed sulphur in water during several years. This injection caused pain, agitation, many movements of deglutition; afterwards evident uneasiness, rejection of food, slow and uncertain walk, slight somnolency, &c. But after some hours, the appetite returned, and recovery followed without further disturbance."

M. G. performed the next experiment on a dog, with two ounces of water, impregnated with pure hydrogen gas. No derangement of function supervened.

Exp. 27.—"On the 9th of Sept. 1821, I injected into the jugular vein of a little sucking pig three weeks old, an ounce of distilled water, mixed with twenty-four drops of ammonia, which was slightly odorous, and probably a little carbonated by the contact of the air, as it deposited a white crust upon the sides of the flask, although it did not effervesce on the addition of sulphuric acid. There was no indication of pain upon the injection; but after some time came on evacuation of urine, and of hard dry stools; uneasiness, fainting, loss of strength, fever with shivering, pain of the belly upon pressure, and after an hour a mucoso-bilious liquid passage, renewed twenty-five minutes after. Four hours and a half after the injection, another liquid and brown stool was passed. It was mixed with clots of blood. From this time return of strength and appetite was observed; the animal sucked. Next day the stools were again liquid. It continued for a week afterwards in a state of languor, without marked disease, and died at the end of nine days. *On opening the body*, there were found ecchymoses or petechiæ in numbers about the heart, intestines, and coverings of the belly; besides, the appendix intestinum was very red, swelled and inflamed in its muscular and mucous coat, with evident suppuration in the interior."

Exp. 28.—"The 29th of Sept. 1821, I repeated the foregoing, by throwing into the jugular of a puppy, twenty-five drops of the same ammonia, mixed with three drachms of distilled water, which caused pain and agitation in the little animal. Afterwards plaintive cries continued for three hours,

refusal of food, dyspnœa, pain of the belly on pressure, alvine evacuations, repeated vomitings, abundant evacuations of urine, came on. But these symptoms gradually diminished, and five hours after the injection the appetite and health returned.

“The same day another injection of forty drops of the same alkali, by the other jugular, was tried, which nearly killed the dog at the moment, by producing a kind of syncope or suffocation, with vomiting, and expulsion simultaneously of urine and fæces. Life, however, gradually returned, and with it uneasiness and plaintive cries, continuing for several hours, as in the first instance, then recovery.

“The next day I injected more than thirty drops, with similar effects; but on the 1st of October, having killed it in some seconds by a different experiment, I found, *on opening the body*, one lobe of the left lung inflamed, congested, blackish, and very hard; but the intestinal canal was healthy, except a large inflamed spot on the mucous membrane of the duodenum.”

Exp. 29.—“25th of September, I introduced into the subcutaneous cellular tissue of the back, which was in an emphysematous state, of a small puppy, thirty drops of the same ammonia, mixed in three drachms of distilled water. After this injection, violent pain, sensibility of the skin to contact, continued cries; afterwards alvine evacuations, at first excrementitious, then liquid, bilious, and gelatinous, supervened. The animal died in twenty-four hours.—*Dissection.* The skin, and cellular texture of the back and sides, were inflamed, red, violet, and infiltrated by a sanguineous serum. The mucous membrane of the duodenum was much inflamed. This appearance was observable, in a less marked degree, in the rest of the intestinal canal.”

Exp. 30.—Was a repetition of the former, with a solution of the muriate of ammonia. This liquid was not absorbed. A large inflammatory tumour, followed by a tedious suppuration, was the result.

M. G. concludes, from these experiments, that it is not ow-

ing to the ammonia that putrid substances, introduced into the circulation, produce the effects which he has detailed; because the hæmorrhagic inflammation of the mucous membrane of the intestines, which was remarkable in the early experiments, did not result from the injection of the ammonia. He afterwards proceeds to detail the particulars of some experiments, in which he injected several of the recent secretions of the human subject, as the saliva, urine, bile, &c. into the veins of dogs. They confirmed those which had been made with the same substances by Bichat, Magendie, and Deidier. The following experiment confirms the information we have previously received respecting the effects of *spurred rye* upon the system, and appears to point to some of the causes of putrid diseases.

Exp. 36.—"On the 31st August, 1815, I injected into the jugular vein of a middle-sized dog an ounce and a half of a strong and concentrated decoction of the spurred rye, previously reduced to powder. Loss of appetite, distress, plaintive cries, feeble gait, with an evident dragging of the posterior extremities, violent vomitings; a few hours afterwards embarrassed respiration, and a febrile pulse, supervened. He appeared much recovered on the following day. His appetite, however, was not restored, and the feebleness of his posterior limbs continued. I then injected an ounce of the same decoction into the jugular. It produced at first vomiting only: but, four hours afterwards, embarrassment of the chest, stertorous dyspnœa, a very frequent pulse, prostration of strength, an impossibility of standing or walking, syncope, interrupted by whining, successively supervened during nine hours. At the end of this period renewed vomiting of bile, and hiccup, came on; and death thirty hours after the first injection.—*Dissection.* The lungs were studded with small round spots, black, without cohesion, and possessing a gangrenous character. The mucous membrane of the stomach presented two black spots arising from effused blood. The muscles were of a much darker colour than natural. The brain was violet, livid, and firmer than usual. The other organs were entire."

M. Gaspard has given a few more experiments, of less interest; they furnish results similar to those we have detailed. We will conclude this very extended account of his memoir by adding a few of his reflections. They are very brief, and refer chiefly to the effects which have been observed to follow the use of putrid aliments upon the human constitution. These, as far as they have been correctly observed, agree with his experiments. M. Fodéré has related that at the siege of Mantua several individuals who had existed on the semi-putrid flesh of a horse, contracted a scurvy, and in some instances gangrene of the extremities. Other instances might be adduced in proof of this point. The effects arising from the use of spurred rye, of old and corrupted vegetable productions, and of animal substances in a state of putridity, are well known. They bear a very striking relation to those which resulted from the author's experiments. M. G. next takes a view of the causes which induce malignant or pestilential diseases, as they relate to his own observations. This subject is not entered into, and far less pursued in a satisfactory manner. He merely hints at the connection. As, however, his present experiments, and others which he may be induced to make, may furnish him with data for future speculation, we will not criticise the very few observations he has now offered. They merely point to obvious relations, in a very general manner. The experiments are chiefly interesting, and these we have given almost entirely.

ART. X. *Observations on the Character of the Diseases which were the Sequel of the Fever described in the 5th vol. of this Journal.* By JOHN R. LUCAS, M. D. of Brunswick, Virginia.

It, perhaps, would not be unacceptable to the readers of the American Medical Recorder, to know the character of

the diseases, which were the sequel of that described by me in the 19th No. of this work.

I will, therefore, endeavour to give a very brief account of them, with the treatment which appeared most successful in my hands.

The typhoid state of disease began gradually to subside about the 1st of January, 1822; and by June, was pretty generally extinct. During the summer, I only saw four cases similar to those described in my essay, in the 19th number of this work. One of these I saw in the commencement, and which after a tedious illness eventuated in recovery. The three others I saw were in consultation. The first died under the operation of an emetic in a few hours after I saw her. The second had been very freely blooded and purged, under which he was completely prostrate, although a remarkably stout, strong, athletic man when in health. When I saw him he was perfectly yellow over the whole of his body, with a black tongue, and in a cold sweat; he died in about twenty-four hours. The third was also a strong, active, muscular man in health. He had been freely blooded, purged, and partially salivated. He died in about forty-eight hours;—confirming, still more clearly, the correctness of my former opinions, that venesection and emetics were inadmissible in this state of fever. The two last patients who died were both about thirty-five years of age, and remarkably robust men when in health; and if any persons could have borne the practice with impunity, I know none more likely to have done it than they. The first who died was a lady; she also had been blooded; and trusting to representations made me, and her apparent ability to bear a mild emetic, I ordered one for the purpose of relieving a very troublesome nausea, she complained of. This emetic was vin. antim.; she made a few efforts to vomit, and, in despite of my utmost efforts, sunk under them. If I ever saw any patient whom I thought able to bear, and profit by an emetic, this was one; for, at the time she swallowed it, she was able to walk across the room; but in

three hours after, she was a corpse. In that immediate district of country where the disease of the last four years had raged most violently, there has been a comparatively healthy season. No dropsical nor hepatic cases have as yet occurred in a single instance, to my knowledge, in any individual who was so highly stimulated by me or my friends in the last four years.

The summer and autumnal diseases of the year 1822 have been generally bilious, and more nearly resembling those of former times, (or as it is expressed by the vulgar) old times, than any that have occurred for the last ten years. They consisted of intermittents, remittents, dysenteries, and hepatic intermittents and remittents.

With but few exceptions, all the severe attacks of disease which I have seen were of the latter kind. It has proved fatal to numbers residing in the vicinity of mill-ponds, marshes, creeks, and rivers, which, from the particular season, have been more than usually productive of violent disease.

That this is not a new state of disease is very certain; it is equally as certain, I think, that it has not been generally and properly understood by many of the faculty in this section of the country, particularly the junior members. My conclusions are drawn from the number of deaths that have happened, as well in this, as in the neighbouring counties of Lunenburg, Nottoway, and Dinwiddie; as also in Petersburg.

There being nothing unusual in the common intermittents, &c. that occurred this season, they do not deserve a particular description. I will, therefore, confine myself to a succinct account of those hepatic intermittents and remittents which I witnessed.

The patient, after a little exposure, and sometimes without it, would feel dull, heavy, and sleepy for a day or so, and would then be attacked with an ague, going regularly once or twice through the usual symptoms of an intermittent paroxysm. The chills then became more

indistinct, and instead of an ague, a coolness of the nose, fingers, toes, and knee-pans were complained of. This was succeeded by a violent fever, which, after several hours, would moderate without the breaking out of any general perspiration. The pulse rather small and hard; the tongue sometimes dry, but generally moist, and covered with a white fur. These symptoms would continue for a few days longer, when the head sometimes became much affected with a strong disposition to coma, and frequently pain; then a general restlessness, sickness, and indescribable anxiety about the stomach, particularly about the accession of the coolness of the extremities, was very common. I do not recollect to have witnessed more general distress, in any other disease, than that which now oppressed the patient's stomach, and caused for several hours, every day, an almost incessant endeavour to vomit. The ejecta were little else than the gastric juice, and a ropy white mucus. During this disturbance of the stomach, the patient would complain much of general heat, and a sense of suffocation, and frequently call for water. The soles of the feet, and palms of the hands, would sometimes be warm, and the other parts of the body cold. Sometimes there was considerable flatulency present, with now and then symptoms resembling colic; and in one instance slight spasms, and in another an indistinct articulation. The pulse small, and very hard, tongue now either black, or of a dark brown, sometimes a shining red, with large papillæ; urine high coloured; bowels slow, unless moved by medicine. In two instances, the thumb of the right hand was pressed down involuntarily to the palm of the hand, and there was considerable subsultus. The appetite was often good, but the food frequently ejected in a short time after being taken in. In some instances there was considerable intestinal torpor, when medicine was taken.

That this state of disease depended on the state of the liver, I never permitted myself to doubt, after seeing the first case or two; although I never examined a patient *post*

mortem, whether hepatic diseases have actually prevailed more generally within the last ten years, or whether we have become better acquainted with them, I will not undertake to decide positively: though I believe the truth lies between the two opinions. That the same practice, which was eminently successful in their treatment eight years ago, is not near so much so now, I believe will be generally admitted by the faculty in this part of the Union. Formerly they readily yielded to the mercurial action; but it is not so now, at least in my circle, and in that of some of my friends.

This disease produced much perplexity with many of the faculty. In some of its features, it bore a slight resemblance to that which prevailed so extensively in some districts of country, for the four preceding seasons, and although many of the faculty could not be brought to confide in the tonic treatment of that disease, yet from the success which they heard had frequently attended it, they could not entirely fail to believe in it; and as the disease in question, on a slight view, bore some little resemblance to that, the practice was, in some instances, applied to it; others, thinking it a common inflammatory intermittent or remittent, would bleed a few times, and administer a few cathartics, and then resort to tonics; others, again, trusted mainly to exciting the mercurial action; others, governed by the state of the pulse, and the appearance of the blood, trusted almost entirely to the lancet. I need scarcely add, that the most violent cases terminated fatally under all these plans of treatment. Under that of the lancet, a very remarkable case occurred, which excited much interest at the time in the neighbourhood. It was the case of a very fine lad of about seventeen years of age. I was called to him in consultation with two other attending physicians.

Such free depletion had been made by the lancet, and the occasional use of a cathartic, that I was deceived in his real situation, and advised a moderate tonic course; it was objected to by the gentlemen in attendance, and their original plan pursued with fresh ardour; in about twelve to

fourteen hours he became prostrate, when bark clysters, strong toddy, &c. were freely administered, and I was again called in. I pressed the tonic treatment, already commenced: for twenty-four to thirty-six hours he revived considerably; after which, he began to grow worse, and to show clearly that his disease was not one of debility. The tonic treatment was discontinued, and blood was drawn, and an injection, and then cathartics had recourse to. His pulse small and hard, and his head much affected, and great gastric distress present. I now, for the first time, saw him have what the attendants called his ague. It was the coolness of the extremities, &c. before described. I became satisfied, that none of us, before, had any thing like a correct idea of the real nature and seat of his disease, and communicated my conviction to the father of the young gentleman, and to one of the attending physicians, and advised a continual catharsis for his relief, with attention to the lancet as a secondary object, and more with a view to moderate, than an expectation of removing the troublesome symptoms by its use. This was disregarded, and a very free use of the lancet was had recourse to; I found the patient the next twenty-four hours much exhausted by the loss of blood, and no better; only one cathartic had been given. I again repeated my former advice, which was again disregarded, and the lancet pressed until it was near effecting dissolution, without its ever producing relief four hours at any one time, or keeping the pulse soft for two hours at a time. I now found the patient in the most extreme state of exhaustion, and a firm belief, in the medical gentlemen present, that the lancet *alone* could relieve; and the father (a piece of a doctor also) of the same mind. Finding that my admonitions were disregarded, and that there was a fixed determination to persevere in the use of the lancet, I determined to retire, and not be responsible where there was no control. About this time my friend Dr. A. Feild, of this county, came in, and after communicating to him my ideas relative to the situation of the

patient, and the cause of the continued excitement in his pulse, he at once saw into the probability of it, and with that liberality which always characterizes the man of science, and the one in pursuit of truth, he admitted that the lancet had been too long relied on, and that it would not cure. It was now agreed to suspend the use of the lancet for the present, and to have recourse to it, only as a secondary means of relief, and that reliance was to be found in exciting, and keeping up, a continual catharsis, day and night, as long as the strength of the patient and the symptoms of the disease required it. This plan of treatment was put into instant operation, with the most manifest and decided good effects. The pulse under the catharsis became soft and full; the sickness of the stomach, and general distress, were relieved, and comfort followed; if the bowels were suffered to remain shut up, for only two hours, all the disagreeable symptoms would instantly return. I visited the patient only a few times after this, and left him in the care of Dr. Feild, and the other gentlemen.

The result of this case exhibits a very striking illustration of the difference between prescribing for the symptoms of a disease, and the cause of it; as well as the very pernicious effects of obstinately adhering to an opinion, only because it has once been advanced.

The practice which I generally pursued, in this form of disease, was to let blood occasionally, and to excite, and keep up a constant discharge from the bowels. To effect this 4 to 5 grains of calomel were given, two to three and four times every twenty-four hours, and 2 to 3 drachms sulph. magnes. were given every two to three hours, day and night: sometimes oil was used. It is inconceivable how soon this would relieve the patient, and how soon all the unpleasant symptoms would come on, on the stoppage of the bowels for a few hours only. The discharges were various, sometimes dark, sometimes muddy, sometimes yellow and green, sometimes like gratings of the potatoe, sometimes mucous, and sometimes having a number of

cheesy or suety lumps in them. Mrs L. of this county, was confined for about four months, of this state of disease, and during the time found but little benefit from any thing except cathartics. At one time she took 2 and 3 drachms of Epsom salts, every two and three hours, for about thirty-five days, and I have no doubt owes her recovery principally to its good effects. I am much inclined to believe, that the many deaths which have happened in this disease, have been owing principally to too much attention having been paid to the state of the pulse, and too little to that of the bowels. It is as difficult to make some persons believe, that a continual catharsis is necessary in the cure of a disease, as it was to make them believe that tonics and stimulants should be proportioned, in quantity and potency, to the degree of debility present to be overcome, and the loss of action to be restored.

I have said that these hepatic affections do not yield so readily to the mercurial action ; this is a fact. I have almost declined the use of calomel, with this view, having in many instances tried it with but trivial good effect, and in some with injury, as it is disposed to bring on gangrene of the fauces, as soon as its specific effects become evident. The same observations have occurred to several of my medical friends.

I think I have seen, during the summer, three cases of genuine yellow fever ; although the idea has been scouted under the erroneous belief that it could only occur in large seaport towns. One of these patients had every characteristic of the fever, including black vomit. Another had most of the symptoms, except black vomit. He was opened after death, and his gall-bladder was distended with a very black matter, about the consistency of treacle with flocculi in it, the stomach and duodenum had sphacelated spots. The third had not the black vomit, nor was he opened after death. He was perfectly yellow over the whole body. His blisters filled with yellow serum, his stools were black, and the egesta, from the stomach, dark green flocculous matter ; I

would as soon argue, that there could not be inflammation, without suppuration, as that there was not yellow fever unattended with black vomit: each indicating only a particular grade, or stage of disease, when present; but not indispensably present as a constituent symptom attendant on the disease, of which they are symptoms.

If, sir, you will not conclude that I am either excessively vain or labouring under an alienation of mind, I will say, that as yet, Armstrong (the most popular modern writer) has afforded but slender grounds to believe, that he is acquainted with genuine idiopathic typhus fever. That he is well acquainted with inflammatory diseases of a typhoid character, is indisputable; and that he has mistaken typhoid pneumonia, for typhus fever, I am entirely convinced. There is a reigning character of disease at all times prevailing; the *livery* of which, *all* other diseases put on during this atmospheric constitution. A want of proper attention to this axiom, has led Armstrong astray. No practical experienced physician will believe, that idiopathic typhus is curable by the loss of 16 and 20 ounces of blood, frequently repeated in the twenty-four hours; though it may cure inflammatory affections, during the prevalence of a typhoid character of disease. With regard to this vegetable typhus, or typhus from *mal aria*, there is nothing new to the majority of southern practitioners. It is a disease they annually meet with, and is one of the commonest forms of our ill-treated, or neglected autumnal bilious fever. I believe it occasioned by a congestion and excitement of the liver, from the want of sufficient alvine evacuation in the early stages, in most instances. While I believe this to be true of most seasons, I have good cause to know that, from 1818 to 1821, in this section of the Union, if it depended on congestion and excitement, that these were in no wise as certainly and as speedily relieved, as by an unsparing use of tonics and stimulants, which in every instance appeared to restrain the inordinate and excessive biliary secretions going forward. During this period I presume the remote causes to have

been unusually severe and intense, acting on a strong typhoid atmospheric constitution, and that the immense secretions of bile witnessed, depended more on a mobility arising from the debility and relaxation of the parts concerned, than from this high excitement. I am the more inclined to this opinion from the fact, that in very many instances evacuants of no sort were admissible; and in all I believe death would have followed the evacuants, before the matter discharged would have assumed a healthy aspect. When added to this, the fact, that in the most violent cases in 1818 to 1821, 12 to 24 ounces of bark, and 2 to 4 quarts of rum were given every twenty-four hours, without previous evacuation by emesis, catharsis, or venesection, and with the happiest effect, I am constrained to believe, that the immense flow of bilious matter must in some way or other have been the effect of a mobility growing out of a debility and relaxation of the parts concerned in its secretion.

A little more time, and a closer and clearer pathological view, will, I think, refer many of the diseases now supposed to be of gastric and nervous origin, to hepatic derangement: and in this viscus, will ultimately centre the typhus of Armstrong.

Brunswick, Va. 6th Dec. 1822.

ART. XI. *Observations on the late Epidemic Bilious Fever, as it prevailed at Harrisburg and the adjoining Districts.*
By DR. SAMUEL AGNEW, of Harrisburg, Pennsylvania.

It is proposed in the present communication to give a history of the fever, which has prevailed so extensively in this place and the adjacent country, for a few years past. It cannot be expected that this effort will be marked by any traits of a novel, or peculiar character. This form of disease has prevailed so extensively in many parts of our country, for many years, that every medical man who has been conversant, for any considerable time, with disease, must

have witnessed its character. But as many young gentlemen, who are now, or will soon be, embarked in the arduous and highly responsible duties of physicians, may be benefited by the experience of those whose lot in society has afforded them ample opportunities for observation, it may not be inexpedient to give them the results of that experience, to facilitate their progress in the commencement of their labours.

As the fever of our summer and fall months is confessedly the offspring of the combined action of heat and moisture upon perishable materials, it will be necessary, in the first place, to present an account of the character of the seasons as marked by the degree of solar heat, the quantity of rain, and the productions of the ground. I will remark that I have been in the practice, for several years, of keeping a thermometrical register of the temperature, noting regularly, twice a-day, at the same time, the course of the winds, and the different rains which fall, together with any other peculiarities which may characterize the season. I have to regret that I cannot add to these observations the variations of the barometer, or any instrument to determine the quantity of rain which fell, or the degree of humidity of the atmosphere.

The fevers to which this essay adverts, having commenced in the summer and fall of 1819, it will be necessary to go back in our observations to that period. As a tabular register of each day's observation, for so long a period of time, would unnecessarily occupy your pages, I shall give a condensed view of the greatest heat, with other meteorological notices, commencing with May, and ending with October, in each year respectively.

State of the weather in 1819, 20, 21, 22, from the first of May, to the end of October in each year.

1819, May,	3 days.	Thermometer stood at and above 80°; highest 85°.
	10 do.	Clear.
	21 do.	Cloudy; on 15 of these there was rain.
June,	14 do.	Thermometer stood at and above 80°; one day 91°.

1819, June,	17 days.	Clear. Several partially clear. Two days, showers. No thunder.
July,	22 do.	Thermometer stood at and above 80°; highest 94°.
	17 do.	Clear.
	14 do.	Clouded; on five of these there was rain. No thunder.
Aug.	17 do.	Thermometer stood at and above 80°; highest 95°
	15 do.	Clear.
	16 do.	Clouded; on ten of these there was rain. Twice thunder.
Sept.	9 do.	Thermometer stood at and above 80°; highest 91°.
	14 do.	Clear.
	16 do.	Clouded; on seven of these there was rain. Twice thunder.
Oct.	1 do.	Thermometer at 78°.
	18 do.	Clear.
	12 do.	Clouded; two days there was rain, and two snow.
1820, May,	1 do.	Thermometer at 80°.
	10 do.	Clear.
	21 do.	Clouded; ten days there was rain.
June,	15 do.	Thermometer stood at and above 80°; highest 94°.
	18 do.	Clear.
	12 do.	Clouded; five days there was rain. Twice thunder.
July,	23 do.	Thermometer stood at and above 80°; highest 93°.
	16 do.	Clear.
	15 do.	Clouded; five days on which there was rain. Twice thunder.
Aug.	18 do.	Thermometer stood at and above 80°; highest 95°.
	22 do.	Clear.
	9 do.	Clouded; four days there was rain. Thunder four times.
Sept.	11 do.	Thermometer stood at and above 80°; highest 91°.
	22 do.	Clear.
	8 do.	Clouded; on two days rain. Thunder once.
Oct.	1 do.	Thermometer at 78°.
	13 do.	Clear.
	18 do.	Clouded; on six days there was rain. Twice thunder.
1821, May,	3 do.	Thermometer at and above 80°; highest 85°.
	12 do.	Clear.
	19 do.	Clouded; on nine days there was rain.
June,	15 do.	Thermometer at and above 80°; highest 88°.
	18 do.	Clear.
	13 do.	Clouded; on five there was rain. Thunder twice.
July,	12 do.	Thermometer stood at and above 80°; highest 89°.
	19 do.	Clear.

- 1821, *July*, 12 days. Clouded; on six of these there was rain. No thunder.
- Aug.* 25 do. Thermometer at and above 80°; highest 92°.
- 20 do. Clear.
- 11 do. Clouded; on four days there was rain. Thunder once.
- Sept.* 7 do. Thermometer at and above 80°; highest 88°.
- 11 do. Clear.
- 19 do. Clouded; on ten days there was rain. No Thunder.
- Oct.* 1 day. Thermometer at 76°.
- 18 days. Clear.
- 13 do. Clouded; on three days there was rain. No thunder.
- 1822, *May*, 5 do. Thermometer at and above 80°; highest 84°.
- 16 do. Clear.
- 15 do. Clouded; on eight days there was rain.
- June*, 14 do. Thermometer at and above 80°; highest 89°. Four days no entry.
- 16 do. Clear.
- 15 do. Clouded; on eight days there was rain. Thunder five times.
- July*, 26 do. Thermometer stood at and above 80°; highest 91°.
- 14 do. Clear.
- 17 do. Clouded; on eight of these there was rain. Thunder three times.
- Aug.* 22 do. Thermometer stood at and above 80°; highest 92°.
- 26 do. Clear.
- 5 do. Clouded; on two days showers. No thunder.
- Sept.* In the first ten days, there were five in which the thermometer rose above 80°; the highest 86°. On the 10th, in the evening, my thermometer was broken. It continued, however, very warm and dry to the 16th. 19 days clear; 11 days clouded; and 5 on which there was rain.
- Oct.* 15 days clear; 16 cloudy; and six on which there was rain. This month was generally mild and pleasant.

It will be proper to state here, that, in designating the clear days, I have entirely excluded those in which any clouds appeared; and that all which were partially clouded, or for a part of the day, if but for one or two hours, are denominated cloudy. It is also to be observed that every day, on which there was but the lightest shower, is denominated rainy.

It will be perceived, by a close inspection, that in the six

months of the respective years, there is not much difference in the character of the seasons, taken aggregately ; and that, by comparing the corresponding months of each year, there is a remarkable similarity, with but few exceptions. This is so strikingly the case, that I was forcibly impressed with it when I began to compare the different seasons. There is this, however, to be observed, that, as respects the rainy days enumerated, there is much more difference in the corresponding months of the respective years, than in the aggregate of each year. Besides, the number of days designating the fall of rain, by no means give a just idea of the quantity which fell in the respective months. For if there was but a moderate shower it is classed in the rainy days, as much as if there had been a long continued and heavy rain. The distinction is marked in my daily register, but, as before observed, it would have extended this communication to an unreasonable length if every variation had been given in detail.

Assuming therefore that certain degrees of heat and moisture, acting on perishable matter, create that state of atmosphere which is the remote cause of our autumnal fevers, which I most unhesitatingly believe, it will be found not an easy matter to determine, why one season should be marked with an almost universal prevalence of fever, when another, resembling very much the preceding or succeeding season, in the concurrence of the causes which produce the remote cause, should be exempted from this scourge. It can only be accounted for, either from the circumstance that we are deficient, or limited in the means of making that close observation which will accurately determine the apparently inconsiderable, yet multiplied variations of atmospheric phenomena ; or from the fact, that, independently of those which are determinable by observation, there is some peculiar constitution of atmosphere, resulting from secret combinations and evolutions of physical causes not cognizable by the senses, or instrumental admeasurement. Although to the latter opinion I feel no particular attachment,

yet it is by no means improbable. It is a sentiment adopted by many distinguished medical men, and which appears to have at least the semblance of probability, from the remarkable coincidence of great terrestrial convulsions and the prevalence of epidemic diseases. Independently, however, of this hypothesis, there is a fact which would forcibly lead to this inference. It is, that fever has prevailed, particularly the last two seasons, almost indiscriminately through the country, where no local causes were perceptible to which it could be ascribed. Situations apparently the most favourable to health, and entirely excluded from the common remote causes of fever, have, during these seasons, been subjected to the common pestilence; while in other seasons they were entirely exempted, although those places confessedly exposed to the common and recognized sources of febrile miasma, were suffering under the influence of these causes.

I shall not proceed any farther in attempting to reconcile these conflicting results from the perceptible and acknowledged causes of epidemic fevers, but go on to state my observations on the character of the respective seasons, as recorded at the time, and the extent of the fever at those different seasons.

It may, however, be proper, before I commence this history as registered, to give a brief description of the locality of Harrisburg, as well to show the relation of remote causes in the production of fever, as that my description of the progress of disease may be better understood.

Harrisburg, the seat of government of Pennsylvania, is about 100 miles west of Philadelphia, and is located on the north-east bank of the river Susquehannah. The river runs in the vicinity of the town about a south-east course. It is about three quarters of a mile in breadth. The current immediately adjoining the town is deep and strong. The beach, in low water, is a complete gravel and sand. The bank, on which Front street lies, is elevated about thirty feet above low water, and is mostly bold and precipitate. The ground is less

elevated as it recedes from the river. The Paxton creek runs in a south direction, about three-eighths of a mile from the centre of the town, on the east side, and empties into the river about one mile below town. This stream is but small, meandering and sluggish; its banks, in many places, low and marshy. There are four streets in the town, which run parallel to the river, called First, Second, &c. There are a number of streets at right angles to these and the river. Market street is the principle of the latter, and divides the town into what are called the upper and lower ends. I do not deem it necessary to be more minute on this subject.

I shall begin with the month of May, 1819. On the 19th of that month, I have noted:—"We have had since the 13th remarkably cold, cloudy and wet weather; quite as uncomfortable, most of the time, as March. 20th. A heavy frost this morning. Fruit not injured, but the tender garden vegetables, and the clover some places are much injured. 31st. This month has been very cold and wet, with the exception of eight or nine days. The latter part of the month has been very healthy.

"*June 16th.* I have had, within the last six days, two cases of cholera, and two of undefined fever; rather intermittent. 30th. The whole month has been remarkably warm, dry and clear. No rain which moistened the earth, and that only partially; very healthy.

July 20th. The pasture is literally dried up. The cattle have to be fed on hay, as in the winter. A few cases of cholera infantum; generally healthy. 31st. Still healthy; cholera infantum more prevalent, though not so much so as I have seen it.

Aug. 6th. I have met with several cases of fever within the last five days. They are generally of an undefined and irregular character; some continued, some remittent, and some intermittent. 26th. Fevers have increased considerably since last date, though generally of the intermittent type. A few of the remittent. There is nothing peculiar in their character. 31st. Fevers have become more preva-

lent since last date. Intermittents much the most numerous. Remittents are not generally of a violent or malignant character, though obstinate and tedious. It is said that fever, especially intermittent, prevails very much down the river between this and Columbia.

Sept. 8th. Fevers increasing in number and violence. Remittent and bilious more prevalent; some disposition to typhus. The intermittents more untractable than usual. The double tertian frequent. The paroxysm is often protracted from one day into the next, so that out of forty-eight hours, there are not more than ten or twelve of intermission. (My paper being limited, the remainder is taken up with the history of a very bad case, which may be referred to hereafter. This therefore is all that is recorded of this month.)

Oct. 1st. The cases of fever increased, from the last date, until near the close of the month. They were not generally of an obstinate or malignant character, especially during the latter part of the time. Intermittents were more numerous than remittents and bilious, and would generally admit the use of the bark more freely and with better success, than in the earlier part of the month.

18th. The change in the temperature of the air, after the heavy rain on the evening of the 9th, produced a number of relapses of the intermittent. The cases of continued and remittent are exceedingly tedious, with very little excitement of the blood-vessels, or even much indisposition, after the third or fourth day. Nothing is complained of but debility; pulse generally small, low and frequent; tongue sometimes dry, dark and husky; at other times furred with white, not much thirst, and skin but little increased in temperature.

1820, *May 8th.* The weather has been exceedingly uncomfortable for the last four days; generally cloudy. Wind north, and exceedingly chilly. Fire has been quite necessary. Healthy at present. Measles still prevail; some cases very bad. *31st.* This month throughout has been

much colder than April. Not, perhaps, that the mercury was lower, but there was so much rain and cloudy weather that every thing became saturated with moisture, and produced very uncomfortable sensations. Fire was necessary a great part of the month. Continues healthy. No disease scarcely but measles. These are subsiding.

June 12th. There have been two cases of measles within my knowledge this month. 30th. The weather has been very dry and warm since the 14th. Continues healthy. A few cases of cholera in adults and children.

July 6th. The weather has been unusually warm and dry for some time. Some cases of cholera, and some of intermittent and remittent fever. Generally healthy. 20th. Within the last week several cases of cholera, among adults as well as children, have occurred. Intermittents are also becoming numerous. I was called to six cases to-day. The lower end of town, next the brick-yards, is particularly affected. 31st. Fevers have become very prevalent within the last ten days. They generally assume the intermittent form; a few of the remittent. Cholera infantum prevails, though I think not so much as last year.

Aug. 14th. Fevers did not appear to increase the first eight or nine days of this month, but have considerably the last five days. Generally they are not of an obstinate or malignant character. They commence, as usual, with great lassitude, soreness, and *pains in the bones*, vulgarly so called, indisposition to action; these symptoms become more urgent, then headach; these continue more or less from three to seven days before the distinct characters of fever appear. Then come chills, rigors, flushes, hot skin, thirst, anxiety, headach, backach, painful vision, pulse frequent, rather tense and full, tongue furred, &c. These continue for twelve, twenty, or more hours; then go off with perspiration. They come again in twelve, twenty-four, or forty-eight hours. 31st. The cases of fever increase rapidly since last date; and the remote cause has extended its influence somewhat farther. The fever is becoming prevalent along the river

in every direction. The fever assumes a more obstinate unyielding character, less disposed to intermissions, more bilious.

Sept. 8th. The fever extends its limits and influence. I have been called to six cases since the 2d inst. in the upper end of town. Not much change in the character of the fever. In a large majority of cases, the intermittent type exists. From the first ushering in of the fever, I mean the incipient paroxysm, no distinct intermission or definite form characterizes the disease until the expiration of the second day. The remainder of this month in the record, is taken up with noticing the cases of fever as they occurred daily. They increased almost daily, till the end of the month. It is noted that a gentleman, aged about 27 years, who had lived all his lifetime on the river, without having fever, was attacked this month.

Oct. 7th. I have had but two original cases this month; these were intermittent. I have had several cases of relapses, where the patient had been well for several weeks. The fever is evidently declining. The cases are almost all of the intermittent form, and generally easily managed. 20th. Cases of fever have declined very much. A few cases of fever have been worse than at any time during the sickly season. They become of the typhus grade, very tedious and protracted. Almost constant delirium, great uneasiness in the bowels; pulse generally small, frequent, hobling, or vermicular; not much increase of temperature; but little thirst, tongue generally moist, irregularly covered with brownish fur. 31st. The intermittent and remittent forms of fever have almost entirely disappeared. Some few cases of a low typhous character, of long existence, still continue. A catarrhal affection has taken the ascendancy, and almost entirely expelled the fever. It generally receives the name of influenza. Its symptoms such as usually attend bad colds; commencing with chills, rigors, lassitude, pains of the muscles, slight fever, cough, headach, some soreness and stricture of the breast, with hurried and painful respiration. But

few cases admit the lancet. Seldom continues more than five or six days.

1821. *May 10th.* This month, thus far, has been healthy. The season is now assuming the luxuriance and sportive gaiety of spring. The woods are cheered with the songs of the warblers. The eye is regaled all around, with the rich profusion of gay and variegated colours. The smell is refreshed with the fragrant odour from orchard, meadow, field, and woodland. 26th. The grain and grass had a very unfavourable appearance two weeks since. They have improved very much the last eight days. Vegetation of every kind looks prosperous.

June 9th. Continues pretty healthy. Several cases of intermittent fever have occurred the last seven days. Vegetation very flourishing. Spring crops and grass very good. 17th. The intermittent is returning. I have had a number of cases within a few days; generally of the tertian type. 28th. Cholera infantum becoming more prevalent and violent. A few cases of intermittent.

July 5th. Less disease now than was fifteen days since. I have no cases of intermittent at present; two cases of bilious remittent. Cholera infantum I think not so prevalent. Measles prevail in town. The disease has progressed in the usual manner; though rather of a violent character.

17th. Fevers increasing fast the last ten days; intermittent and remittent, perhaps a greater proportion of the latter than usual. I have had two or three cases of a violent and obstinate remittent, something bilious and nervous. Cholera infantum not quite so prevalent. 25th. A great deal of rain fell on the 23d and 24th. The ground is completely saturated, vegetation very luxuriant. Fevers increase; I think there are more of the remittent and bilious than at this time last year: arterial action perhaps greater.

Aug. 10th. No rain since the 24th ult. Ground has become dry, roads very dusty, waters low; vegetation rather suffering. The cases of fever have increased since last date; though I think not during the last six days. The country

more sickly than town. The cases in the middle and upper part of town, are more numerous than at this time last year. I have had seventeen or eighteen cases of fever above, or north of Market street, within the last twenty days. The fever, in its approach, symptoms and progress, is very much like the fever of last season. I am however disposed to think there is a greater proportion of remittent and continued form, and that it is rather more unyielding than last year. I have bled in several cases with advantage. Some cases have been unusually tedious. The bowels become the seat of much disorder in the advanced stage; diarrhœa, prostration of strength, stupor, indistinct articulation, tongue dry, red, sometimes slightly furred, and sometimes brown, and slightly blackish; skin not much above the natural temperature. Seldom perspiration, pulse small, frequent, and sometimes hobbling. 21st. There appeared to be a suspension of the fever from the 4th to the 12th. After this time cases increased till the present date. The town however is not as sickly as at this time last year. The country generally more so. Fevers are not confined to streams or low grounds. Many families in the country have the fever who are remote from the usual sources of miasma. The continued and remittent form more prevalent in proportion than the intermittent. Although we have had two showers since the last general rain, the earth is still dry. 31st. The fever prevails to a greater degree, since last date. I am however inclined to believe there are not as many cases in town as last year.

Sept. 6th. There has been rain every day this month. On the 3d, it rained pretty constantly, and frequently fast, all day. Heavy showers on the 4th, and a light one on the 5th. Ground appears well saturated; though the streams are but little raised. Cases of fever increase; new cases daily. 20th. The fever evidently declined after the last date. It is not easy to assign a cause; for the weather was generally very warm, and several rains fell which ought rather to favour the production of miasma. There are still how-

ever new cases occurring almost daily; and probably in the last four or five days, they are more numerous than for ten days before. Relapses of the intermittent are very frequent. 30th. The cases of fever became more numerous towards the close of the month. Although the weather was cooler, it had no influence in lessening, but rather increasing the number of the sick. No material change in the character of the fever. I have heard of several cases of dysentery, though I have seen none. The season latterly has been very favourable to vegetation. Several rains fell which moistened the earth well.

Oct. 10th. The cases of fever evidently increased from the beginning of this month to this date. Perhaps there is a greater proportion of intermittents than heretofore. The remittent and continued more disposed to a typhus state. The arterial action not so great. 22d. The fever is declining; very few new cases during the last four days. More of intermittent than any other form. We have information from various directions, that fever prevails to an alarming degree. Many places which were but partially affected during the summer and early part of fall, have latterly become very sickly, with considerable mortality. 31st. Fever disappearing fast; I have had but two original cases since the 21st instant. Some protracted chronic cases and relapses. The health of the town and country is rapidly improving. The weather has been unusually fine, but dry. No rain since the 12th. Frost almost every morning since the 18th.

1822, *May 10th.* Vegetation presents a flattering aspect. The meadows and fields are generally covered with a luxuriant verdure. The fruit trees have for some time emitted a rich fragrance from their luxuriant boughs. The forests are now fresh and green with foliage, and the woodland songsters delight the ear; all present a rich feast to the eye, the ear, and the smell.

A number of cases of intermittent and remittent have occurred this month. Some few cases of pleuritic and

pneumonic character, marked with rather low action, and a tendency to degenerate into typhus. The inflammatory state of disease is yielding to the less excited, but more obstinate forms of fever. 22d. Not so much disease, though still some cases of remittent and irregular fever with pneumonic symptoms, especially among children.

June 15th. Very little disease at present; a few scattering cases of intermittent. I had three cases of disease in the family of A. W. rather of an anomalous character. The bowels were violently affected with frequent painful dejections, mixed with blood and mucus. I have not pronounced them dysentery, though they resembled it much. (I have no doubt now but these cases were of a dysenteric character.)

There have been several refreshing showers during this month, though the streams are low, especially the river. Vegetation appears to be doing well. Grass and clover will generally be good. Wheat, in many parts of the country, is very bad. Corn and oats begin to look well. 27th. I was informed by some farmers they would reap to-day. Harvest is about five days earlier than common. Bowel complaints continue pretty frequent in and about town. Many believe them to be dysentery. The symptoms are, frequent stools, with considerable pain and straining efforts; stools bilious, variously mixed, and of different consistence. Often blood appears mixed, and sometimes nearly pure; there is often fever, but not generally much. I am informed that dysentery prevails in Hanover township, about ten miles east of this place, very generally, and is considerably mortal. 30th. Very little sickness at present in this place and immediate vicinity. Cholera infantum does not so generally prevail as in some previous summers. Harvest progressing, ground dry, waters very low.

July 5th. Showers passing in different directions most of the day. About one o'clock, a considerable rain; and half past six o'clock, a very fine rain fell. Vegetation much refreshed. The town and immediate vicinity remain very

healthy; a few scattering cases of chronic intermittent, and some cases of cholera infantum. Dysentery prevails to an alarming degree in Hanover; many mortal cases. It has appeared in two cases in Paxton township, which lies between Hanover and town. 19th. Three of Mr. F.'s family, in town, complaining to-day of the usual precursors of fever. Another person also made application for the ague. 22d. The fever is increasing in town, and along the river and creek. Several new applications to-day. I have not yet perceived any thing new in its character. It has the ordinary precursors and attendants of the fever of this season of the year. 31st. The dysentery, so far as I can learn, does not extend so rapidly in the country as it did some time since; perhaps, owing to the fact, that most of the families have been the subjects of it. I am also inclined to think that the fever of the intermittent and remittent form is supplanting the dysenteric form. The former increases, though not fast; some cases occurring in town almost daily. I see very little, if any, difference in its character, from the fever of the preceding years. No rain, except a gentle shower, for eleven days. Ground very dry and dusty. Vegetation suffering.

Aug. 6th. Dysentery appears to abate considerably in Hanover and Paxton, where it first prevailed. It prevails considerably in Clark's, Stoney, and Fishing Creek Valleys, about nine or ten miles north of town. The people living remote from medical aid, and rather opposed to its assistance, from ignorance and parsimony, have neglected the sick, or perhaps injured them by an injudicious use of nostrums and popular remedies. I was informed that eighteen or nineteen had died in Fishing Creek Valley, of this disease, in the course of three weeks, principally children. I have two cases of dysentery in town at present. Cases of fever are still occurring, but by no means frequently. Town may be considered pretty healthy. The earth has become completely exhausted of moisture; the streams are drying up; vegetation is literally burning. The record goes on to

state daily, the cases of fever and dysentery as they occur. At the close of the month, I state that I had, during this month, fifty-one cases of fever, forty-five of them in town: fourteen cases of dysentery, and eleven of them in town. I must remark here, that three-fourths of my practice is in town; so that no fair conclusion can be drawn from it of the comparative health of the town and country.

Sept. 1st. The weather continues still dry. The ground is literally like a brick. The corn-blades and stalks have been, in most of fields, completely dried up. Some farmers have topped their corn. Potatoes very scarce; sell in market at seventy-five cents per bushel; no cabbage or buckwheat. Pasture burnt up. Creeks and runs nearly dried up; wells failing. The town is comparatively healthy; dysentery is subsiding; some cases of fever. 30th. There had been no rain to moisten the earth from the 13th July to the 16th inst. There were two very gentle showers in July, after the 13th; but one in August sufficient to lay the dust; none in this month till the 16th; then, although the shower was refreshing, still it wet the earth very little. The vegetation was literally burnt up; the foliage of trees was withering; farmers were feeding their cattle with hay. The town remained pretty healthy till about the 10th. From that time fever increased, though not rapidly, nor to near the same extent as the two last summers and falls.

Oct. 28th. The preceding part of the month was taken up with noting daily the cases of fever and dysentery. On this day I remark:—Commenced raining yesterday morning early, continued most of the day moderately; rained heavily most of the night; cleared off to-day about eleven o'clock, very pleasant. The ground appears to be pretty well saturated. Fall grain generally looks well; pasture good. Our markets very good. Butter considerably lower than for three months past. Very little disease for two weeks past; but a solitary case of fever here and there. I have had a few cases of inflammatory sore throat."

Such is the history of the fevers which have prevailed in

this place and adjacent county for the last four summers and falls, together with the vicissitudes of weather, and other meteorological notices, recorded as they passed under review from month to month. It is with some reluctance that I have exercised the privilege of extending this history to so great a length, by probably indulging too much in detail; but I was anxious to afford the opportunity, to such as might desire it, to compare the character and progress of the fevers with the different atmospheric and other changes of the seasons, in order to ascertain their relative influences and connections. Whether any deduction of a practical nature, worthy of notice, is attainable, I leave for others to discover. For my own part, although the universally received doctrine, that these fevers are the effect of an inquinated atmosphere, is fairly inferrible from the history, because they did not commence either of the years, until solar heat, moisture, and vegetation, were in appropriate degrees; and uniformly subsided when these causes disappeared; still the increase or decrease of fever, in short periods of time, or any material change in the violence or mildness of the fever, are left to me utterly inexplicable; as well as the fact, that during the last two seasons, fevers prevailed in places apparently excluded from the influence of the acknowledged remote cause; unless it be referred to the suggestion noticed in a preceding part of this communication. But leaving this subject at present, I shall proceed to give a description of the charactêr of the fever, with as much accuracy as I can, observing the utmost brevity.

Symptoms of the Fever.—The first approach of fever was often imperceptible by the subjects. A listlessness, lassitude, a general soreness, as commonly expressed, pains in the extremities, and want of appetite, were the most usual premonitory symptoms. These would exist for some days, varying from two to six, or seven, without much increase, or the patient being conscious of much indisposition. The next symptom, which was the most unequivocal and universal index of the commencement of fever, was a chill, or alterna-

tion of rigors and flushes, continuing for a longer or shorter period, with a proportional increase of the premonitory symptoms. Reaction followed the chills, rigors, or shakes, evidenced by a frequent, sometimes full and tense pulse, a hot dry skin, thirst, acute headach, pain in the loins and extremities, painful vision, great sensibility to noise, and a general restlessness. These would continue generally from twelve to fourteen hours, often to twenty and twenty-four, and sometimes to forty-eight, when they would gradually subside, in the most of instances, with a perspiration. When a complete and distinct intermission of fever continued for twelve or fifteen hours, the paroxysm generally returned with a chill or ague, and ran through the course of symptoms above delineated. Frequently, however, there was a mere abatement of the paroxysmal symptoms, forming a remission, which continued a few hours, mostly in the morning, then a recurrence of all the symptoms of a febrile paroxysm, generally without any previous chill or shake, took place. In other instances the remission was very indistinct, and scarcely perceptible; but a continuation of febrile excitement, with an aggravation of all the concomitant symptoms, such as more frequent and irregular arterial action, intense thirst, an arid, pungently hot skin, flushing of the face, inflamed, watery eye, a dry, red husky tongue, stupor, and delirium. These are to be considered as the most ordinary symptoms attending the fever; but they by no means were universal, either in their number, order, or force. Some patients suffered from the intensity of one, and some from another; while the others were very mild, or not perceptible. In all the different forms of intermittent, remittent, and continued, there were deviations and peculiarities. The head often was, almost exclusively, the seat of concentrated pain, sometimes the back, and not unfrequently the extremities. The stomach in some, and the bowels in others, were the seat of the greatest derangement, the former organ becoming exceedingly irritable, continually under the influence of nausea, and often rejecting the mildest drinks.

In each form, many patients were surcharged with bile, while others appeared to suffer little from its accumulation. Sometimes the intermittent assumed all the characteristics of cholera, returning with regularity either as a quotidian or tertian. I have seen a few of these cases where the paroxysm was exclusively marked as a violent cholera, which would last three, four, or six hours, leaving the patient much exhausted, but free from disease till the periodical return. I have found difficulty in convincing these patients that their disease was an intermittent; and this was only effected, by inducing them to take the bark freely, when the disease soon yielded. It was not unfrequent to see an intermittent run into a remittent, and continued, and vice versa; and also to degenerate into a complete typhous state. I saw two cases which began as a common intermittent, one a quotidian, and the other tertian, assume, after some days, the most unfavourable aspect, when the patients, during the paroxysm, became totally insensible to all impressions, attended with laborious, stertorous breathing, and expired under the second recurrence, with all the characteristics of apoplexy. It was by no means unfrequent, that a fever which commenced with the ordinary symptoms of a remittent, gradually put on the complete character of what I call the typhous state. This was marked by a small, frequent, hobbling, soft, vermicular pulse, great prostration of strength, not much thirst, tongue sometimes furred with white, sometimes nearly natural, at others dry, with a brownish or deep red shining surface, and again black, with deep fissures in the upper surface; teeth covered with sordes, eyes glazy and inanimate, countenance hypocratic, delirium, subsultus tendinum, stupor, skin not much above the natural temperature, sometimes rather cool, lying on the back, with knees drawn up, bowels often torpid, sometimes a diarrhœa, with involuntary stools. Such were the common symptoms which marked this state of fever. But it is not to be understood they were either uniform in their number or violence.

Cure. This of course would depend on the indications

presented to the mind by the various phenomena of the disease. The first remedy which most generally appeared to be indicated, was something to evacuate the stomach and bowels. In some of the seasons emetics were first administered. These were mostly of the tartarized antimony ; at other times a cathartic of jalap and calomel was first directed. In a large majority of cases I administered the emetic first, and frequently followed by the jalap and calomel. The necessity of giving the last would depend on the effects of the emetic. If these were pretty active, dislodging the contents of the stomach and bowels pretty effectually, and particularly when a distinct and perfect intermission of fever took place, the cathartic was sometimes omitted. If the type of the fever had been evolved before seeing the patient, and it was the intermittent, I always advised the emetic to be given about one hour before the expected return of the paroxysm. This would in some, but few, instances arrest the progress of the fever. In a few cases of all the seasons, but particularly the two last, I used venesection. The height of the febrile paroxysm was chosen as the most favourable period for its use. The indication for this remedy, was a full, strong and tense pulse, a plethora of the general system, with a concentration of action in some important viscus. In the distinct intermittent, after an efficient evacuation of the primæ viæ, the bark was adminished with freedom, and almost invariably with success. If I had twelve or fifteen hours of intermission, I always urged the necessity of taking one or two tea-spoonfuls of bark every hour, so that from one to two ounces might be received before the next periodical return. Owing to much prejudice against the bark, and its being rather unpleasant, it is very difficult to induce patients to take the necessary quantity. I have, however, by earnest expostulation and intreaty, generally succeeded in accomplishing my object. And in urging them to use the bark, I often impose no restrictions as to quantity, but advise them to take as much as their stomach will receive with-

out revolting, and be regulated in the repetition by the disposition of the stomach. When this advice is faithfully pursued, the disease is almost invariably arrested. My patients have often taken from two to three ounces in the course of twelve and fifteen hours. In one instance a young lad of about sixteen years of age took two ounces, at two doses, in the space of two hours. I am satisfied that the failure of the bark, in intermittents, is, in nineteen cases out of twenty, owing to the inefficient manner of administering it. I know of no remedy which is so well entitled to the character of a specific as this, in intermittent, when the system is properly prepared, and it is taken with promptness in the requisite quantity. Much depends also on the quality of the bark. We often receive that which possesses very little energy, and consequently disappoints both physician and patient. When the disease becomes obstinate, or chronic, from the inefficient application of the appropriate remedy, or from any other cause, the arsenic has often been found effectual. I believe it a very safe and successful medicine, when administered with prudence, and at the same time with decision. I however do not think it so well entitled to commendation as genuine cinchona. The cold bath was, in some instances, used with success, applied a short time before the expected approach of the paroxysm.

When the fever assumes the remittent or continued form, after perhaps one venesection and emetic, cathartics of calomel, magnes. sulph., mag. calc., ol. ricin. and senna and manna, are repeated according to circumstances, at the same time using diaphoretics and refrigerants of different kinds. The Dover's powder was found a very useful and efficient sudorific. Equal parts of aq. ammon. acetat. and spt. nit. dulc., sometimes with the addition of a small quantity of laudanum, were also useful during the excitement of the paroxysm. In those cases where there was not much arterial action or local determination, but a general restlessness and anxiety, with increased temperature of skin, I have found

the last mixture exceedingly useful in calming those sensations, and shortening the paroxysm, by inducing a pleasant perspiration. The affusion of cold water generally over the body was also found very grateful and refreshing, and appeared, in some instances, to promote the termination of febrile excitement. When these remedies did not produce the desired effect, calomel was generally administered, with the intention of exciting a moderate ptyalism. It has, however, been remarked by the other physicians, as well as myself, that this Sampson of medicine, has frequently been shorn of its locks during the prevalence of these fevers. I recorded, in September, 1820, this unexpected result, and I have frequently, since, had the mortification to witness the same fact. I have, during the last fall, observed, in several cases, that a mercurial impregnation would suspend the fever for some days, but it would return, mostly in the form of intermittent. I am still decidedly in favour of attempting a mercurial action, in all tedious remitting and continued fevers. It will in a majority of cases succeed.

When these fevers become protracted, or assume the typhous state, other remedies are indicated. Although I am decidedly in favour of the purging plan, in low and obstinate states of fever, as well as many other forms of disease, yet it has been found, in many instances, utterly impracticable to rely with hopes of success on this plan of treatment. Indeed, from the feeble and limited administration of these remedies by Hamilton, I should expect but little advantage in combating the Herculean powers of our North American diseases. When the system became prostrated, the pulse small and feeble, in short, when all, or most, of the symptoms existed, as delineated in the typhous state of fever, it became necessary to adopt a very different treatment: stimulants of the most potent and diffusible nature, were imperiously demanded. Camphor, volatile alkali, wine and brandy, were then to be administered with liberality and expedition. To these were added sinapisms, external rubefacients, and epispastics. These remedies, promptly and perseveringly used, would in a majority of cases prove suc-

cessful. I have seen some very hopeless cases relieved by this mode of treatment.

Epispastics were very generally used in all the states of fever, except intermittent, by most of our physicians. I am not in the practice of applying them as frequently as many others. For, although I believe them very efficient in many cases, I have thought that they were used too indiscriminately or unnecessarily. I have succeeded in relieving many violent cases of remittent without their application. I conceive them peculiarly appropriate when there is any local determination to the head or any of the viscera. In all cases of low and typhous fever, I consider them highly useful, perhaps indispensable.

Thus have I endeavoured to give a brief and general outline of the curative treatment of our late epidemic. I am conscious that it is defective from oversights and omissions; but I have the pleasure of saying that I have found this plan, substantially adopted, very successful in combating the pestilence in all its protean shapes. In the summer and fall of 1821, when this disease visited almost every family in town, and multitudes in the country, I attended and prescribed for probably 300 patients, of which I lost but one in town, and two in the country, too distant to receive the necessary attendance.

From the preceding history and observations it will be manifest, that although there was much uniformity in the fever of the different seasons, and much similarity in the character of each year separately, yet there were striking deviations. It becomes a question then, whether these different aberrations, marked by peculiar symptoms, were essentially of a different character, arising from specifically different causes, and possessing a distinct pathology. For my own part, I have no hesitation in adopting the negative of the proposition. One of the first laws of inductive philosophy is, that no more causes than are competent to produce an effect are admissible. Now that a contaminated atmosphere, arising from the decomposition of perish-

ble matter, or chemical changes in terrestrial bodies, visible or invisible, does produce what are called fevers, is an universally acknowledged fact. Why not then ascribe to this source exclusively the remote cause of our autumnal fevers, and account for the various deviations from the general character, by the aid of adventitious causes? The circumstances which take the denomination of predisposing and exciting causes, in connection with the endless variety of constitutional diatheses, will abundantly account for the diversified condition of febrile patients sickened from the same remote cause. To those causes must be attributed the multiplied deviations from the ordinary course of symptoms in many diseases. How account for the very different train of indications, in several individuals, under the disease of small-pox? Here the cause is acknowledged to be specifically the same, yet in half a dozen of different individuals the disease may put on as many distinct appearances, from the most mild distinct, with one or two pustules, to the most malignant confluent. The same observation applies to various pneumonic affections, in our systems of nosology, called pleuritis, pneumonia vera et notha, influenza, &c. For my life I never could assign to these their respective characteristic symptoms; nor do I think worth while, for any practical advantage, to set down and conjure up the hair-splitting distinctions of nosological profundity. I know that all of them may and do exist under a common atmospheric cause, modified by exciting causes, but more especially constitutional diatheses. The same mystery has always presented itself to me in a multitude of cutaneous eruptions. I never scarcely pretend to give them their position in the nosological ranks. I am content to be governed by the general indication that there is a deranged action of the cutaneous exhalants and absorbents, connected often with a morbid condition of the chylopoietic functions, and intestinal excretions.

Nosology has no doubt its advantages, particularly as an index for reference, and combining under general titles dis-

eases which have some prominent features of similarity; but is very inadequate to a practical analysis of disease derivable from symptoms. It may assume the humble, yet useful, office that a botanical nomenclature does in ascertaining the medical properties of plants. It will designate classes and genera by certain likenesses common to each, but will not determine the essential qualities, nor the particular parts in which the medicinal virtue exists. This is only to be ascertained by patient and accurate observation or experiment. The great business in the practice of medicine is, if possible, to ascertain the remote cause, and by close and discriminating observation to determine its general and prominent operations on the animal economy. Then to regulate the remedial plan by these general indications, holding in view the diversified complexion that may be given to the operation of the same cause by local circumstances, exciting causes, and constitutional peculiarity. The application I would make of these principles to my present purpose is, that in our treatment of epidemic diseases, called fevers, we are not to be regulated by names appropriated to technical niceties and fanciful distinctions, often the result of preconceived notions and an animalcular vision in determining specific differences. Where we see a strong impression of the family likeness, we are not to bastardize the individual who may have a squinting eye, pug nose, or bandy leg. I would therefore treat as kindred, all febrile diseases bearing the general outline of the offspring of miasmatic origin, whether called intermittent, remittent, continued, typhus, yellow fever or plague, accommodating my prescriptions to the several deviations from the common character, occasioned by localities, exciting causes, and individual idiosyncrasies, and watching the progressive changes occasioned by their separate or combined influence, in the different stages of the disease. I might add much more, but I fear I have trespassed too long on the reader's patience.

Harrisburg, Penn. Dec. 17th, 1822.

ART. XII. *An account of a number of Worms found in the Kidneys of a Hog.* Communicated by DR. EDMUND PORTER, of Frenchtown, New-Jersey.

WORMS of various descriptions have been found in almost every part of the human body; viz. in the lungs, the liver, the stomach, the intestines, the vagina, urinary bladder, &c. but I do not recollect to have seen any account of their having been found in the *kidneys*. The following instance of their location in these organs may, perhaps, not be uninteresting to the physiologist.

In the latter part of January, 1819, I purchased a hog that had been killed three days before, and was completely frozen. A butcher was employed to cut it up, and the meat was placed in a tub, where, owing to the coldness of the weather, it was suffered to remain ten or twelve days. On taking out the lard, a considerable quantity of purulent matter was discovered exuding from the kidneys. On opening them, I found ten or twelve *round worms*, resembling the *lumbricoides*, measuring from two to four inches in length, of a whitish semi-transparent colour, through which could be traced distinctly an intestinal canal containing dark grains of matter. How were the ova of these worms deposited in the kidneys? What was their nutriment? These are questions which I will leave others to answer.

ART. XIII. *A Memoir on Bronchotomy; read before the Medical Society of Maryland, December 1822.* By HORATIO G. JAMESON, M. D. Surgeon to the Baltimore Hospital.

In looking around for a subject for the present memoir, circumstances presented themselves, calculated to induce me to make choice of the operation of bronchotomy. In speaking of this operation, I shall not lose sight of the fact,

that there is no subject in surgery about which surgical writers more universally agree, than they do as to the safety, the propriety, and the necessity of the operation of bronchotomy. Neither does there appear to be almost any difference of opinion as to the circumstances requiring the operation. But there appears to have been a strange and unaccountable listlessness or timidity on the part of the profession, in not performing the operation oftener. It is, therefore, principally with a view of reminding the profession of the duty they owe their patients, and of the sanative means they possess in the operation in such cases, that I earnestly solicit their attention.

Such are the number and respectability of authorities in favour of this operation, that the only difficulty seems to be, how a judicious selection shall be made. It would seem, from these assertions, that I might be very brief in disposing of my subject; but it has become my duty, in self-defence, to cite some authorities, in support of my principles and practice, in order that I may do away certain incorrect remarks made by Professor Pattison before his class, on a case which I lately published in the *Medical Recorder*. As he pointedly condemned both my principles and practice, I trust I shall be excused for speaking specially, so far as may be absolutely necessary to rebut the censure thrown upon me, in relation to the operation alluded to.

I have asserted that the safety, propriety, and necessity of the operation of bronchotomy, has been so long, and so generally acknowledged by surgeons, that little or nothing new or important can be said in its favour. But as it has been asserted by Mr. Pattison, that if he were to meet with any number of cases of extraneous bodies lodged in the trachea, he would not operate unless the symptoms were more urgent than they were in the one I have reported; his opinion and mine have been placed diametrically opposite; and as a correct decision of this question may involve in it the lives of many human beings, I consider it my duty to defend my principles and my practice in a public manner, in order that my opinion may have equal currency with his.

Mr. A. Cooper says, the symptoms succeeding the lodgment of foreign bodies in the trachea, "do not constantly follow one course. Sometimes they continue without interruption in the same degree. *Sometimes they subside altogether, but afterwards return with increased violence.* In other examples, they only cease in part, a local pain, an oppression, and a difficulty of breathing continue. *In short, they conduct the patient, by a longer or shorter road, to death, which is almost always inevitable, unless the surgeon interpose his assistance.*"

I need not, I am sure, say one word in support of Mr. A. Cooper's authority. But I have seen some cases, and have others reported by physicians, in which the observations made, agree with those of Mr. Cooper. Mr. Pattison, however, stated to a large class of students, that because he found his patient, two or three times, free from severe suffering, and at play, that no operation was warrantable, and that he had, and always would refuse to operate, unless the symptoms were more urgent. That he never will again refuse to operate under similar circumstances, I think I may venture to affirm; but it might be otherwise with those whom he instructs, and who look up to him as a guide. Notwithstanding what he has said, however, it is a fact, that during the week which he visited the child, it was several times at the very point of death from strangulation; the distressed mother, frantic with apprehensions of immediate death, ran with him to a window, and struck forcibly upon the back, and thus, for a time, relieved him from his peril. Surely no one acquainted with the nature of this accident, would expect to be sent for in a fit of strangulation, and arrive in time to operate and save life. Instead of adopting such an unwise course, we ought in all cases where the symptoms intermit, after foreign bodies have passed into the trachea, prefer operating during the most favourable interval from suffering; for although the operation in the adult is a very simple one, in children it is essential that every thing be well arranged; the patient must be secured

by careful and steady assistants, or terrible accidents may happen. Pelletan has justly remarked, that in children, these cases require a skilful hand ; and Dr. Mott, of New-York, found some difficulty in dissecting down through the throat of a very fat child.

A man of sound reflection, knows that thin bodies like a watermelon-seed, a button-mole, and the like, can only partially obstruct the windpipe, and that the symptoms will therefore be likely to intermit. Such small bodies may lay a long time in the ventricles of the larynx, without producing much disturbance ; but experience shows us that such a person is liable, every moment of his life, to suffocation.

The case related by Desault, of a cherry-stone remaining in the ventricles two years, and then producing sudden and unexpected death, is a striking instance, among others, of the imminent danger in which such persons are placed. A grain of corn, a bean, or similar substance, which may enter the trachea of a child, being acted on by moisture, will be likely to produce constant suffering, especially as, in such a case, the ventricle will swell and the trachea contract. These cases will be likely to lead to violent symptoms or sudden death.

Mr. Pattison justifies himself and condemns my operation, because, he says, guineas and other foreign bodies are often found in the lungs on dissection. I admit that a few cases have been reported, where extraneous bodies laid a long time in the trachea, without producing violent symptoms. Bartholine and Tulpius have reported such cases. It is highly probable, and there are many facts to support the probability, that the substance, in such cases, must lodge in the ventricles. When such bodies fall down into the trachea, dreadful sufferings or death must speedily succeed, unless the patient has the good fortune to cough it up. This, we know, now and then happens ; but we know equally well, that such persons hold their lives on a very uncertain tenure, as many examples will testify. Mr. M'Colloch's son, of this city, an amiable lad of thirteen years of age, received a

bean into the trachea ; violent suffering succeeded ; but he afterwards became so much relieved, that he considered the confinement enjoined by his physicians unnecessary ; he obtained his mother's consent to leave the room ; in the act of putting on his coat he was seized with a violent cough ; his mother, alarmed at its violence, caught him in her arms, and there he died before any person could come to her assistance ; in short, his death was instantaneous. What a lesson is here ! Why was this young gentleman left thus to perish, after the many successful operations which have been published, together with the correct views of Louis ?

Mr. Pattison speaks of foreign bodies having been found in the lungs ; but what was the history of these cases ? A life of suffering has invariably attended all such cases in this country, and there have been very few exceptions in any country ; so that where foreign bodies have been found in the lungs on dissection, we have a right to conclude that the patient was destroyed by them. Dr. Bailie, in his extensive collections of morbid anatomy, does not mention a single case. The only case of which I have actual knowledge, is a preparation in the possession of Dr. Jeffrey, at Glasgow. The patient swallowed a large piece of charcoal ; it nearly filled the trachea, and destroyed life in three days. This poor man wanted nothing but a resolute tyro in surgery, to have saved his life ; and the case shows us that he had not access to a surgeon, or that he fell into the hands of a very timid or ignorant one. The time is at hand when a museum of such preparations will consign a surgeon to utter disgrace. There have been so many successful operations reported, and so few unsuccessful ones, that a surgeon who opposes the operation on any ground whatever, stands completely isolated, without the consolation of one substantial reason, or respectable precedent to support him.

You will find my operation recorded in the *American Medical Recorder*.* Owing to circumstances there stated, the operation was delayed five weeks ; the child suffered

* Vol. v. p. 673.

more than you can well conceive ; was several times so low, that the gentlemen in consultation with me were, at times, unwilling that we should engage in the operation. We took him in a favourable interval, and we saved his life.

Mr. A. Cooper tells us that small bodies are sometimes coughed up and swallowed ; and Pelletan, finding a piece of flesh lodged in the larynx, performed the operation of laryngotomy, then passed in his finger and forced the substance into the mouth, and it was swallowed ; this patient recovered. Had this happened in my case, I might have been placed in an unpleasant situation. For very soon after the operation was performed, Dr. Cromwell was asked by Mr. P. whether he really saw the watermelon-seed come out of the mouth. Had it been swallowed, I should, no doubt, have been charged with operating unnecessarily, or of having attempted a trick ; to think of which is almost infamous.

Fortunately, however, the evidence of the seed's having been dislodged by my efforts for that purpose, and the relief from those efforts, were too clear to be doubted by any gentleman present.

Mr. Pattison, being unwilling to allow any merit in the operation, on finding what I had done, stated to his class, that the seed was coughed up, and yet in my report of this case, which he must have read, I stated circumstantially, that I let in a portion of blood with a view of obstructing the trachea, by forming a coagulum about the seed ; that I then passed down my forceps and irritated the trachea at its bifurcation, and obtained the aid of the convulsive force of the muscles of expiration upon the obstructing body, and that the seed, being put in motion by the forceps, was violently expelled. Had Mr. P. reflected upon what I have stated, it must have been plain to him that the epiglottis was taken by surprise. By laws of life, peculiarly associated, any irritation excited about the larynx or glottis, will cause the epiglottis to close upon the rima glottidis, for that is its office ; but in this case, a violent counter-irritation having been excited low down in the trachea, the parts about the glottis

were thrown into a state of momentary relaxation, which enabled the expelling force of the air confined in the bronchia to expel the seed. This has been the most usual way that extraneous bodies have been removed ; the article coming sometimes through the mouth, but oftener through the wound in the trachea. On what ground, then, could a surgeon declare that *the seed was coughed up*, and thus insinuate that it was not the surgeon, but nature unaided, that relieved the patient ? I made an opening in the trachea, passed down my forceps, turned the seed, or at least endeavoured to do so ; the expulsive power of the respiratory organs set it rapidly in motion ; then if the seed lay below the forceps, slanting down from the wound to the anterior surface of the trachea, the seed must pass up behind the forceps, and if with sufficient force, and not too large, the foreign body will be expelled through the mouth, as happened in this case ; but fortunately the patient did not swallow it. If the forceps slanted from the wound to the posterior surface of the trachea, then the foreign body would pass out through the wound. Is the operation any the less perfect, whether the extraneous body pass out through the wound or mouth ? An operator acquainted with the subject, will expect to obtain the offending body generally, by the aid of the expulsive power of the respiratory organs. This is ably illustrated by Mr. Hunt and Mr. Earle, who have lately published an interesting case, with judicious remarks, in London. These may be seen in the Medical Recorder, accompanying my case ; the views I had taken, supported by my case, and that of Dr. Harper, which I have noticed, agree most strikingly with the views and practice in the London publication.

Mr. A. Cooper remarks, that substances which are loose at first may, by moving about in the trachea, become fixed. This may be owing to the tube becoming filled with coagulable lymph, by which may be formed a thick membranous lining, as happened in the case of Dr. Mott, which I shall notice presently ; or a sharp-pointed body may, by the efforts of coughing, become engaged firmly in the trachea. Any

thing causing inflammation, or a high degree of irritation of the larynx, will more or less interrupt the epiglottis in its office; and hence it is that sharp-pointed bodies, either by their attrition or fixing a point in the trachea, will produce much suffering and danger. In the latter case we have little or nothing to expect from the expelling powers of the thorax: we must dislodge the body, as did Pelletan with his forceps a fish-bone.

I shall now exhibit a short notice of cases which have come to my knowledge, in this country. Dr. Mott, of New-York, took out of the trachea of a child a peanut-shell, and, although he operated under unfavourable circumstances, the patient recovered. Dr. Annan, of Emmetsburg in this state, performed the operation of bronchotomy for the removal of an extraneous body in the trachea, and saved his patient. Dr. Thomas Peach, of the late army, performed in the state of Vermont this operation, in a case of measles which had been given over, and restored his patient to health.

I operated at the end of five weeks, and though my patient was much reduced, he recovered without one unpleasant symptom after the operation. Thus it appears, that of the four cases which have come to my knowledge, in which the operation was practised, the patients all recovered. Let us now look at the reverse of the medal. Dr. Mackenzie, of this city, saw a case where a patient suffered greatly, at times, about five years, to say nothing of the risk of suffocation. At the end of this time a watermelon-seed was coughed up. The editor of the Medical Recorder had knowledge of a case which ended fatally without an operation. Dr. Williamson, of this city, saw a case prove fatal by inflammation and debility, in about four weeks, from swallowing a watermelon-seed. Dr. Emory, of the Eastern Shore, had knowledge of a case which ended fatally without an operation. Dr. Crawford, of Virginia, lost two sons, in their infancy, in consequence of one of them swallowing a persimmon-stone, the other a bean: they were not operated on. Walter Smith, Esq. of Penn. had a little son

who swallowed a cherry-stone : he suffered terribly, and was many times at the very point of death from suffocation. After some weeks' suffering he threw up the stone.

I wish now to look abroad, where we shall find an abundance of materials highly interesting. Mr. Chevalier opened the trachea, and let out some ounces of a darkish fluid, in a case threatened with suffocation : the patient recovered. Mr. Samuel Cooper saw a similar case with Mr. Laurance : the patient recovered. Dr. Bailie saw a patient suffocated by a thickening of the membranes about the larynx. This patient ought to have been saved. Percival and Farre saw cases which ended fatally from inflammation about the larynx. Mr. Laurance saw such cases, and strongly advises the operation of bronchotomy, and also in quinsy, &c. Louis saw a case very similar to my case. He says, the phenomenon most difficult to explain in this case is, *the calm which at times existed*. He proposed the operation : other gentlemen in consultation insisted that the foreign body was in the œsophagus. They prevailed, and the parents refused to allow the operation. The child died in a few hours afterwards, and the substance was taken out by Louis, with unexpected facility. This child would have been saved, had Louis been as fortunate as I was, in having in consultation two gentlemen whose views corresponded exactly with my own. These gentlemen have benefited mankind in no small degree, by sanctioning an operation which will, in all probability, save many valuable lives. Still I claim no particular merit for the consultation, because they chose the operation, since all surgical authority is with us ; but knowledge had become obscured, and almost useless, from some peculiar sort of indecision or timidity on the part of the profession. In addition to this we had to encounter the displeasure of the surgeon, who had expressly declared that he would perform no operation, unless the child exhibited stronger evidence of danger. We had hoped, however, that our efforts would be looked on in a spirit of forbearance, and that success, in which was involved the honour and welfare of the

profession, would have secured us from the censure of every member of the profession. Very different has been the result; for we have been held up to the students of our college as daring adventurers, obtaining success by chance. Surely he who opposes measures deliberately devised, regularly and systematically executed, by which results are obtained highly honourable to the profession, ought to be known. Is the dignity of the profession to be supported by tamely suffering a professor, in a spirit of jealousy, (disregarding all surgical authority,) to condemn the principles and practice of other members of the profession, by his mere *ipse dixit*, which too often is law with medical students? In justice to the school, however, it becomes my duty to say that Dr. Davidge, the surgical professor, has always been a warm advocate for the operation of bronchotomy in its proper place. But to return more particularly to my subject, I shall now cite more cases. Mr. S. Cooper says, that tumefaction is a natural consequence of an extraneous body being lodged in the trachea. He cites the case of a monk who got a cherry-stone into the trachea: he suffered violently for a time, then became easy. The stone remained thirteen months without producing any severe symptoms: he was then seized with violent symptoms, which nearly destroyed him; it was thrown up, covered with a considerable concretion. This gentleman died soon afterwards of consumption. Mr. S. Cooper says several similar cases are on record. Pelletan once operated too late; but, although the patient died, great relief for a time succeeded the operation. In this case the patient evidently died from exhaustion; but so strongly were the muscles excited by the operation, that the bean was thrown out two feet from the wound. *This must have been a great cough.* Pelletan, who frequently performed this operation, took out by means of forceps, through the wound, the jaw-bone of a mackerel, and saved his patient. There is a curious case reported in the London Medical and Physical Journal, where, owing to concretions continuing to form, the surgeon was compelled

to leave a tube in the wound several months ; yet this patient did well. Boerhaave mentions a case that ended fatally, by suffocation, while efforts were made to remove an enlarged tonsil. This patient ought to have been saved, by opening the trachea before attempting the removal of the tumour. In Dr. Mott's case, at New-York, in addition to extracting the extraneous body, the doctor found it necessary, by means of a bent probe, to remove a considerable quantity of a membranous substance, which had collected in forty hours. It was necessary to keep the wound open eight days : the patient did well. Engel, Wendt, and Guncourt have reported successful cases in which extraneous bodies were taken from the trachea. Benjamin Bell saw several cases end fatally, where extraneous bodies had been swallowed, and lodged behind the trachea in the œsophagus. Desault mentions a case where the woman died in three minutes, from getting a bone lodged in the œsophagus. Here a tyro in the profession might have saved a life, by opening the trachea instantly, and then the bone might have been cut out or pushed into the stomach. In this case he ought to have acted promptly, and used a common pocket knife, as advised in urgent cases by Mr. A. Cooper. This gentleman supposes, with several others, that in these cases death is often owing to spasm being excited about the glottis. Indeed there are strong reasons for believing that this is most usually the cause of death, from substances lodged either in the trachea or œsophagus ; for we know that substances lodged in the œsophagus do act in that way, and most substances which get into the trachea are too small to act in any other way. Bichat was aware of the risk of spasm about the glottis, from substances confined in the œsophagus, and therefore he advises a speedy operation in these cases. He mentions a case in which an opening was made into the trachea : the patient died, and when examined, the substance was found in the œsophagus. In this case the substance must have been lodged below the opening, so that it pressed up against the posterior and membranous

part of the trachea. Had tracheotomy been performed here low down, instead of laryngotomy, this patient would probably have been saved. Here we see the impropriety of the French practising laryngotomy, and the English tracheotomy: both may occasionally be necessary. Habicot performed bronchotomy on a boy who, to save a purse of gold from thieves, swallowed nine pistoles, in a linen purse. He was almost gone when Habicot arrived; but having been speedily restored to his respiration by opening the trachea, the purse was afterwards passed, by means of a probang, into the stomach, from whence it was gradually discharged, and the boy soon regained his health. Benjamin Bell strongly advised this operation, on account of tumours in the mouth, so situated as to endanger the patient from suffocation; and he says that, in the removal of an enlarged tonsil, &c. it would sometimes be highly dangerous to engage in their removal, without first opening the trachea. He judiciously cautions us to ascertain carefully whether the swelling be not a suppuration, which may be much more easily relieved by opening the abscess.

Mr. Astley Cooper mentions a case of a wound of the neck, in which the patient was suffocated, by a large mass of coagulated blood pressing on the trachea. This patient lived an hour, and probably fell a victim to a want of proper attention, or the want of the necessary surgical aid, and might have been saved by ripping open the windpipe with a penknife. Mr. Cooper advises the operation of bronchotomy in cases of great enlargement of the tongue. Desault saw cases of polypi in the trachea: for the removal of these, Mr. Cooper advises opening the trachea and cutting them away. Mr. A. Cooper says, that bronchotomy should be performed in cases of drowning and other cases of strangulation; he objects to the proposal of Desault and Pelletan, for passing a flexible tube through the glottis; he says, that the introduction of the tube is a very difficult matter, owing to the peculiar structure of the epiglottis.

From the hoarseness and soreness which I have always

seen succeed recoveries from submersion, I am inclined to believe that, notwithstanding what Pelletan has said about the insensibility of the trachea in drowned persons, there is much to be feared from the irritation which will be excited as the patient begins to recover ; and therefore I agree fully with Mr. Cooper, and many others, when they say that, in such cases, it is best to have recourse at once to bronchotomy. Desault owes the method of treating such cases by means of tubes to Hippocrates. The long interval through which this method was laid aside, from the time of Hippocrates to Desault, is a strong circumstance in support of the belief that the successors of Hippocrates laid the method aside, on account of the many difficulties and imperfections attending it. The want of suitable flexible tubes rendered their practice less perfect ; but Mr. A. Cooper says that sufficient trials of this method, made in England, prove decidedly that it will not answer. Besides, Mr. S. Cooper, who I think gives too much importance to Desault's method, says that surgeon wrote from theory. It may not be wholly uninteresting to remind the profession, that Galen says, that the invention of the operation of bronchotomy is due to Asclepiades ; that Avicenna and Rhazes speak of this operation. The ancients, believing that cartilage would not unite when divided, shows how reluctant they must have been to open the trachea ; yet we see them practising this operation in preference to using the tubes, as advised by Hippocrates, who has said, "*Fistulæ in fauces ad maxillas intrudenæ, qua spiritus in pulmones trahatur.*" Pelletan saw a case where a piece of the epiglottis had been cut loose, and happening to fall into the rima glottidis, instant suffocation succeeded. In such cases it would be well to examine carefully ; and if any part hung pendulous, or much loosened, it would be best to open the trachea. Habicot saw a case in which many wounds had been recieved about the throat, and the patient, in consequence of the injury, was in imminent danger of suffocation. Bronchotomy was performed, and the patient relieved from his peril.

Mr. A. Cooper says there are many similar cases on record. Wounds of the throat may act by producing inflammation, or by exciting spasm.

Flajani operated twice on account of inflammation about the larynx: one case was relieved; the other was performed too late to expect advantage from it. Benjamin Bell says, that catarrhal defluations sometimes close the glottis by their acrimony: he supposes it operates by causing stricture. This author saw a patient nearly suffocated by a sudden swelling of the tongue, caused by the abuse of mercury. His advice was opposed till the patient seemed to be expiring. An opening was made into the trachea; the man revived instantly, and recovered.

It has been proposed, in cases of violent spasm from tetanus and other causes, to perform the operation of bronchotomy. Some years ago Dr. Physick proposed trying the operation in a case of hydrophobia: the consultation actually met for that purpose in Philadelphia; but the patient was found dying, and the operation was of course omitted. I think it would be well to try it in that disease. I have elsewhere said that spasm about the glottis is probably the most usual cause of death by suffocation. The experiments which have been made, with a view of denying this opinion by dissection, are altogether futile. The freedom of motion in these parts admitting of relaxation of the muscles after death, is a confirmation of their liability to spasm when endowed with life.

As a prelude to a description of the operation of bronchotomy, I shall now proceed to notice the anatomy which may be considered as having some relation to the operation. It will be remembered that the carotids lie almost in front of the trachea, low down; higher up they lie close to its sides. The left jugular, or great crucial vein, lies in front, hardly under the sternum. Mr. Burns has seen the innominate as high up as the lower edge of the thyroid gland. The recurrent nerves given off by the parvagus pass under the sides of the trachea. The thyroid gland, and its veins and

arteries, may be wounded without risk ; but by a cautious dissection we may avoid these parts.

Of the method of operating.—There has been a good deal said about the preference in respect to laryngotomy and tracheotomy: neither can be exclusively right; both operations have their advantages. I think nothing can be more clear than that, in cases requiring merely a passage to be made for the breath, a puncture through the crico-thyroid membranes, as suggested by Mr. A. Cooper, is the most eligible method; he advises us to keep near the cricoid cartilage, to avoid an artery passing along the lower edge of the thyroid cartilage. The most convenient method in general will be, to enter the knife through the crico-thyroid membrane, and then cut a little up or downwards, or both, as the case may seem to require, for the removal of an extraneous body. We should not, however, lose sight of the advice of Flajani, to avoid injuring the thyroid cartilage in cases of high inflammation of that part.

Before commencing this operation the patient, if timid, or a child, should be carefully secured by steady assistants; the patient being laid on his back, should have his head held back, so as to make the trachea as prominent as possible. Having divided the integuments about two inches in front of the trachea, the cellular structure below should be cautiously dissected through, by which we will avoid any considerable artery or vein. Then a sharp-pointed bistouri should be passed in, and the necessary division of the cartilage made. A probe may now be passed down, and an effort made to dislodge the foreign body, by irritating the trachea. Should this not succeed, pass down an eyed probe armed with a piece of sponge, passed through its eye and well secured; this will soon produce a violent struggle, by which the substance may, in general, be expected to be violently expelled through the wound or mouth. Dr. Harper, of this city, has seen this method succeed. Should your efforts still not succeed, extend your incision if necessary, and pass a finger up to examine the ventricles, where you will sometimes find the substance lodged. If it is ascer-

tained that nothing is lodged in the ventricles, we should pass down delicate forceps, and dislodge any substance which may have become fastened; in this way Pelletan removed sharp bodies. Forceps suitable for this purpose may readily be made by bending a piece of pretty thick silver, or other wire so as to make the two ends meet, which should be flattened. Should a sharp-pointed or large body remain firmly fixed low down and create much difficulty, I would not abandon the patient, but would proceed to lay bear the trachea low down, by turning aside the sterno-thyroid muscles, &c.; and by a very deliberate dissection, open the trachea freely there.

We have been admonished by B. Bell to secure all vessels which we may happen to cut, before we proceed to open the trachea. If we are prepared to use the eyed probe and sponge, this advice had better be followed; but I have proved by my operation, that instead of any danger being likely to proceed from this occurrence, we may admit blood safely and advantageously in some cases; but we should err greatly if we were to close the wound before the bleeding has entirely ceased; a severe cough would be the consequence. The wound, in ordinary, should be carefully closed by sutures and adhesive plasters. Sometimes circumstances exist which will prevent our closing the wound. I have already noticed such cases, in which the trachea was kept open from a few days to several months; and these cases all terminated favourably. Heister and Raw having been foiled in getting out foreign substances, left leaden tubes in the trachea a few hours, when these substances were expelled by the expiratory powers. Surely Mr. P. had forgotten these cases when he contemptuously said the seed was coughed up.

Such is the irritability of the trachea in some instances, and I believe in a majority of instances, that no tube can be borne. Mr. Lawrance has ingeniously suggested, in such circumstances, to cut out a small piece of the cartilage, and leave a sufficient opening into the trachea. This ad-

vice is highly important. I have seen a case of wound of the trachea, where the tube was entirely divided, and a wound made into the œsophagus; it was necessary to leave an opening of this kind, owing to the patient's not being able to bear the common silver tube of Richter's invention a single moment. This man recovered without any appearance of inflammation reaching the lungs, but his sufferings were terrible. B. Bell cites a case where the trachea was nearly divided, and the œsophagus opened, yet the patient recovered. This author says, the œsophagus has been opened and healed in dogs and other animals, without any dangerous symptoms having appeared; he therefore advises, in extreme cases, opening the œsophagus in the human body. John Bell was of the opinion that the trachea could not be completely divided, without injuring the great blood-vessels or nerves, which must always prove fatal. Mr. A. Cooper, however, says expressly, that he saw cases where the trachea was completely divided, and cites several others from respectable authors. Wounds of the trachea, we are told by Mr. A. Cooper, often do well, even bullet wounds. Ravaton mentions similar cases. Mr. Cooper says that Bichat has greatly overrated the risk of the operation of bronchotomy. The case which I have already alluded to, at the Baltimore jail, of an entire division of the trachea, and in which it was necessary to apply sutures, is highly important, and shows that wounds of the trachea are not apt to be dangerous. I have seen several severe wounds of the trachea made with an intention of committing suicide, all of which did well; in one instance, many wounds had been made by a table-fork, in a fit of insanity, so as to let out a little air under the skin, but no unpleasant symptom appeared. During the late war, Mr. John Levering of this city, was shot through the mouth and the top of the glottis, so that he could not swallow. Under the care of Dr. Davidge he soon recovered. I trust I have given abundant proof of the safety of the operation of bronchotomy, as well as of its utility, and of the small risk of inflammation of the tra-

chea or lungs, from opening the trachea for the purpose of removing extraneous bodies, &c.

It might naturally be expected that some account of the symptoms ought to have been given; these are too irregular and diversified to be detailed. The cough and dyspnœa in the case I have reported, were precisely similar to croup, and the child always pointed to the left side of the trachea, at the sternum, as the seat of pain; besides he swallowed a watermelon-seed, and was nearly suffocated at the time, and often afterwards. A good deal has been said about the risk of mistaking bodies lodged in the œsophagus, instead of the trachea, and that in order to prevent mistake, we should never operate without first passing a probang down the œsophagus. This, in cases admitting of any doubt, may be important advice; but Mr. A. Cooper has observed, that large bodies cannot be expected to enter the trachea, and that small ones lodged in the œsophagus are not at all likely to produce alarming symptoms.

Before leaving the subject it may not be amiss to remind you, that a surgeon once in operating on the trachea, opened the carotid artery, as we are informed by Bichat; that Louis has correctly said, that where bronchotomy is used as an extreme measure it will seldom succeed; where it is used in proper time it will seldom fail. Lastly, you will have perceived that I have derived my information principally from B. Bell, Cooper and Travers, Desault, Hunt and Earle, and the Medical Dictionary of Samuel Cooper, edited by Dr. Anderson of New-York.

REVIEWS.

Quidquid venerit obvium, loquamur
Morosa sine cogitatione.

MARTIAL.

ART. XIV. *A Comparative View of the Sensorial and Nervous Systems in Man and Animals.* By JOHN C. WARREN, M. D. Professor of Anatomy and Surgery in the University at Cambridge. Boston, printed by Joseph B. Ingraham, 1822. 8vo. pp. 152.

WHILE the comparative anatomists of Europe have been acquiring distinguished honours for themselves, and adding to the renown of their respective countries by their splendid and important discoveries, the anatomists of this country have devoted their attention almost exclusively to the human system, regardless, in a great measure, of the different tribes of subordinate living beings, whose complex and diversified organization constitutes the legitimate object of comparative anatomy.

To this general remark, however, we feel pleasure in stating, that there are some honourable exceptions, and we have good reason to believe that this department of science is begining to be more properly appreciated, and only requires the fostering aid of a liberal patronage to enlist in its pursuit, the active and enterprising genius of our countrymen.

We may form some estimate of the importance of this study, when we reflect, that the facts and principles developed and established by its prosecution have contributed,

more than almost any other researches, to illustrate and confirm the obscure and unsettled doctrines of physiology.

The knowledge of our own structure and its laws, must necessarily be promoted and improved by investigating attentively the organization, functions, and faculties of different brute animals, each peculiar in its formation, and yet all differing from ourselves.

Comparative anatomy, including its physiology, whether considered as the only true foundation on which we can classify and arrange all animated nature, or as the analysis which nature herself has made of different living beings, we regard of sufficient importance to constitute an indispensable part of the education of every medical student.

It is important, in the prosecution of every scientific pursuit, to adopt, when practicable, the analytical mode of research. In human physiology, however, which has always been justly regarded as a fundamental branch of medical science, analytical investigation cannot be directly applied. This will appear sufficiently evident, when we recollect, that the human system is composed of numerous diversified organs, all intimately connected, yet each having a distinct function to perform; and that the vital principle, which gives to this body its peculiarity, which separates it from dead matter, and which preserves it from the influence of the various active chemical agents by which it is surrounded, results from, or at least is dependent on, the entire and perfect state of this organization.

From this view, it must appear obvious, that any attempt to investigate the phenomena of life by the usual analytical mode of research, must eventuate in total disappointment; for the moment we should separate the several organs which enter into the composition of a living body, that instant the phenomena of life would cease; because, as we have already remarked, these phenomena absolutely depend upon the perfect state and combined action of the several organs.

This analysis, however, which we cannot apply to any single individual, Nature has performed for us, and we are

only required to examine, compare, and draw our conclusions.

Nature, ever abundant and inexhaustible in the variety of her productions, presents to us, in the formation of the inferior orders of animated beings, every diversity of form and arrangement of organs necessary for an entire analysis of the most perfect and complex organization, and its vital phenomena.

Regarded in this light, comparative anatomy and physiology are of such obvious importance, that we cannot but view with regret and astonishment the apathy which prevails among the trustees of the several medical institutions in the United States, relative to this branch of medical education.

To the zealous labours of the comparative anatomists of Europe, we are indebted for some of the most superb works of modern science. Their number, however, and the splendid and expensive manner in which they have been presented to the public, preclude the students of anatomy, in this country, from having that general access to them, which is required for a clear and comprehensive view of the subject. They must therefore feel deeply obligated to Dr. Warren, for the present publication, which contains a condensation of the labours of others on the "comparative view of the sensorial and nervous systems of man and animals," illustrated by facts and observations of his own. Having made these general observations, we will examine more in detail, though every cursorily, Dr. Warren's book. The preliminary part of this work is devoted to the consideration of zoological arrangement. After examining somewhat in detail the different systems which have been proposed, the Doctor adopts "that of Linnæus, improved by Cuvier and others."

"According to this plan animals are separated into two grand divisions, *Vertebral* and *Invertebral*. The vertebral are, first, *Mammalia*; second, *Aves, Birds*; third, *Reptiles*,

Reptiles; fourth, *Pisces, Fishes*." These classes are generally known and distinguished from each other.

"The Invertebral animals are first, *Mollusca*, so called from the soft consistence of their bodies; although they have frequently a shell or firm mantle. Second, *Crustacea*, covered with a thin calcareous crust. Third, *Insecta*. Fourth, *Vermes*. The red-blooded worms are the only invertebral animals with red blood. Their structure is more complicated than that of worms, generated in animals or epizoa-ry worms; the latter are therefore not included in the class, Worms; but in that of Zoophytes. Fifth, *Zoophytes*, so called from forming an intermediary structure to animals and plants. They differ, however, essentially from the latter, and approach the former in generally having the power of locomotion."

We pass over the full and accurate view, which our author has given of the brain and nervous system, in all their variety of form and arrangement exhibited in the several species of these different classes, and only notice such parts of the work as are deserving of particular attention.

In presenting our readers with the following conclusions, which our author has deduced from this general comparative view, we believe, we not only consult their interest, but at the same time exhibit a pretty fair specimen of our author's style of writing and manner of reasoning.

"In the first place, we are allowed, I think, to infer that the brain and nerves are not essentially connected in function; or at least, that this is true in regard to the function of the nerves. There appears to be no relative proportion in the magnitude of these organs in different animals. In man, and most of the mammalia, the bulk of the brain is considerable, compared to that of the nerves; while in reptiles and fishes the *nerves* may compare in size with those of the superior classes, but the brain is very small. The same is true in different orders of mammalia; in the horse, for example, the brain is small, the nerves of great size. Another

fact bearing on this point is, that in the invertebral animals there is no proper brain : at least the organ we call by this name in the acephalous mollusca, crustacea, worms, and insects, differs greatly from the brain of the vertebral animals, and is in truth little different from the ganglia. Yet in these animals the nerves are very distinct, and even in many, large in proportion to the other organs. Analogical reasoning is useful where we cannot resort to facts : but we should not have it applied too confidently, nor even without recollecting that the degree of belief due to it is lower than that belonging to fact.

“ *In the second place*, we may conclude that the brain is not the source of the muscular power. This conclusion is founded on a consideration of the disproportion in the size of this organ, to the muscular strength of various animals. In the horse, the brain, as just stated, is small, the muscular vigour great ; in the great sea shark, *squalus maximus*, the brain, compared with the body, is near the smallest among the vertebral animals ; while the strength of the animal is so great, that one of them has been known to drag a vessel of seventy tons, under full sail, against the wind.

“ *Third*. It seems probable that the muscular power does not take its motion from the nerves. The facts in support of this opinion are few in number, and the principal one is the non-existence of nerves in some animals capable of moving. In the gelatinous polypi and some other zoophytes, no nerves have been discovered, and we are, from their texture, led to believe it impossible they should have any such nerves as other animals ; yet they move, some of them with considerable rapidity.

“ *Fourth*. Many of the facts tend to prove, that the nerves receive the impressions of objects made on the external senses, and that by them these impressions are transmitted to the brain. It is not intended here to involve the hypothesis, that perception in the brain is caused by any kind of movement in the matter of the nerve ; all that we wish to say is, that when the nerve, expanded in an organ, is affected by

objects to which the organ is susceptible ; it is in consequence of this affection that the brain perceived, and that, without the continuity of nerve, the brain cannot perceive. This has been thought to be satisfactorily proved by the suspension of perception, consequent on the division of a nerve ; but those who maintain the opposite doctrine, consider the division of a nerve so far to impair its perfection, as to render the experiment uncertain.

“ If we look to comparative anatomy to determine these questions, we find that whenever an organ of sense is more than commonly developed, the nerve belonging to it is in the same degree developed in the organ. Further, that the size of the nerve before reaching the organ is always proportioned to the development of the nerve and organ ; and that whenever a sense is wanting, the nerve usually going to the organ of that sense is also wanting. In birds the sense of sight being acute, the optic nerve is largely developed in the organ ; the size of the organ, and the size of the nerve before reaching it, are considerable, and there is a ventricle connected with the nerve. We have before noticed the same fact in regard to the olfactory in some quadrupeds. Why should the optic nerve be of large size between the brain and the eye ; except to transmit to the brain the impressions received in the eye ?

“ In the whale, the organ of smell is wanting ; the nerve, sent to it in other mammalia, is also wanting.

“ In some birds, the organ of touch is placed at the extremity of the bill, and there is a correspondent arrangement of elegant nerves of the fifth pair. The same is true of certain quadrupeds, as the elephant, which has the sense of touch at the extremity of the trunk ; and the *ornithoryncus paradoxus*, the duck-billed animal of New Holland. In this singular creature, most of the qualities of a quadruped are united, with some of those of a bird ; and, particularly, it has a bill like a duck, covered with a sensible membrane, which enables it to discover its food in the mud, where it could not employ the sense of sight ; and the distribution

of nerves accords with the peculiar situation of this sense. The manner in which the nerves act in transmitting impressions to the brain, or causing perceptions in this organ, is no more explained by comparative anatomy than by the numerous experiments and theories on nervous action; nor have we much reason to expect we shall ever be well acquainted with the functions of this part of the animal fabric; though Sir Everard Home seems to think his late discovery of the mucous matter, connecting the globules of nerves, will throw light on its mode of operation.

"*Fifth.* The brain is the common centre for receiving the impressions transmitted by the nerves, and is therefore rightly called *sensorium commune*; and where there is not a proper brain, the ganglion, which supplies its place, performs the same office. In all animals with organs of external sense, the nerves belonging to these organs go from them to the brain. This is true, not only in the more perfect animals, it is so in the mollusca, crustacea, insects, and annelides: with the inconsiderable exception that, in some instances, the nerves of an organ of sense are connected with the brain, or substituted ganglion, through the medium of the collar, instead of being immediately so with the brain.

"*Sixth.* This comparative view of the sensorial system does not seem to support the opinion, that the difference in the intellectual faculties of man and animals is to be explained by a difference in organization alone."

We offer no apology for this long extract. The importance of the principles involved in these general deductions, their necessary connection with correct views of physiology, and their ultimate application to practice, must, we think, render them valuable to every reader. The question in relation to the *location* of mind and its faculties, with the numerous animal propensities, is handled in an able and luminous manner; and we think the zealous admirers of Dr. Gall's hypothesis, if they are open to conviction, will have their enthusiasm not a little abated, after perusing the facts which our author has adduced, and his clear and can-

did reasoning on the subject. Although we have already quoted so largely, we must trespass still further on our readers' patience, while we present to them a small, but interesting portion of our author's labours on this particular point of inquiry.

"The authors of the craniological or physiognomical system," says Dr. Warren, "seemed disposed to refer frequently to comparative anatomy, for the support of their doctrines; but so far as I have observed, there do not appear to be very good grounds for such a reference. If any animal be remarkable for a propensity, and exhibit a peculiarity in the form of the cranium, they connect these two facts together, and consider the peculiar part of the cranium, or of the corresponding brain, to be the seat of the propensity; and this they think certain, when such facts concur in regard to more than one kind of animals; and they believe that these facts tend to confirm the connection between similar appearances and propensities in the human species.

"One or two examples will be sufficient to show how far they are justified in their appeal to the anatomy of animals. The organ of *combateness* or courage, is said to reside in the space between and behind the ears; that is, in the part which corresponds to the posterior inferior angle of the parietal bone, behind the mastoid process: and 'courageous animals have the head between and behind the ears, large.' Some of them, in truth, have the head large, but not the brain. The cavity of the cranium in the *lion* and in *large dogs*, is oblong, in a direction from before backwards; the skull is narrow at this part, and the appearance spoken of does not exist in the bones. In the skulls of two lions in my possession, and various large dogs, the cranium is more narrow at this part than in the skulls of *various monkeys*, and is not materially broader than in the sheep. In birds, the cranium of an owl is broader than that of an eagle. The great apparent breadth, in this part of the head of the lion, is produced by the enormous thickness of the temporal

muscles, and when they are stripped off, the skull is seen to be actually narrow.

"The *organ of amativeness*, which Dr. Gall formerly called organ of physical sensibility, is placed in the cerebellum, its region externally, corresponding with the lowest posterior part of the os occipitis. An examination of this region in animals, remarkable for the propensity, does not exhibit a considerable development of the part. In the monkeys generally, it is much less developed than in man; and in the baboon, the most extraordinary of all animals for the propensity, it is in no way remarkable.

"Further, a comparison of the proportionate bulk of the cerebellum is still more unfavourable to this opinion; although Dr. Spurzheim seems to consider this as one of his strongest positions; for the cerebella, he says, are always proportioned to the propensity; they are larger in men and males, than in women and females; and, on the whole, he concludes, 'that this organ and its special faculty are fairly established.' If the table of the cerebellum, before given, be noticed, it will appear that the proportion of the cerebellum is, in many animals, greater than in the monkeys, and that precisely the same proportion exists in the baboon and in the horse: animals differing widely in the degree of this propensity.

"On comparing the skulls of various birds, I have not been able to verify, in a distinct manner, the supposed situation of the *organ of tune*; and the remarks relating to some other parts of the structure of the brain, and to its organs in animals, have not appeared to be stated in such a form as to render it possible to determine their exactness."

We cannot agree with our author, that "all the variations in the form and colour of man, are to be ascribed to the gradual operation of moral and physical causes, acting for a great length of time." We have felt no little interest in this question, and have read with considerable attention, all that has been advanced in its support, by Dr. Smith, of Princeton, Mr. Lawrence, in his lectures on physiology, and

many others ; but we think the powerful reasoning of Mr. White, of Manchester, and Dr. Caldwell, now Professor at Lexington, Kentucky, on the opposite side of the question, has not as yet been fairly met, and remains unrefuted. The plates we consider a valuable addition to the work ; they are accurately delineated, neatly executed, and illustrate satisfactorily, the variety of the nervous arrangement in the invertebral animals.

In conclusion, we have only to remark, that we consider Dr. Warren's work a valuable addition to the anatomical literature of our country, and should be in the hands of every student of medicine. B.

ANALECTA.

Decoction of Oak bark, used as an application to reducible Hernia.

"For these many years past, I have used for reducible hernia, either in the adult male, female, or in children, a strong decoction of oak bark, with wonderful success. In men I have succeeded in curing them from birth to 75 years of age, and in women to 50 years of age. Children are very easily cured by this means, particularly of the umbilical hernia.

The manner of preparing the decoction is, to macerate a few pounds of oak bark in a sufficient quantity of cold water, for twelve or twenty-four hours, then to put both bark and solution into a large boiler, and to keep the fluid at the boiling temperature, over a gentle fire, for two or three days, adding, when required, boiling water from time to time, so that the bark may be always covered. The intention is to extract all the virtues of the bark. The bark, after this slow decoction, should be removed, washed with more boiling water, which is to be added to the strong decoction, and reduced to the consistence of nearly an inspissated juice. When used, it should be warmed, to suspend the astringent matter; the hernia must be previously reduced; then the groin bathed or splashed, and the truss applied immediately after. The application should be repeated three or four times a day. In this way I have succeeded in curing herniæ of many years standing, in the course of a few weeks. In general, it requires a perseverance of three months. A case of double rupture, one of which the patient had laboured under for twelve years, was cured in nine days. He was 36 years of age, and had been invalided out of the public service for the complaint. In umbilical hernia, so common to children, it succeeds very soon.

The *modus operandi* appears to be, *first*, the corrugation of the skin and contraction of the muscles; *secondly*, increased determination to the part; *thirdly*, a deposition of substance, most probably cellular substance, which effectually shuts up the aperture. That there is a contraction of the muscles, we are entitled to conclude, from the tumour not so readily protruding after each application of the decoction. That there is a local determination, is evident from the stimulus applied, and the heat produced. *Lastly*, that a deposition of substance takes place, we are entitled to infer, by the treatment proving effectual in the cure of crural hernia, where no muscular contraction can take place to any extent.

This invaluable remedy was mentioned to me by a merchant in this neighbourhood, who cured himself after having laboured under the disease for many years. In 1757, an hospital was constituted, near Westminster Bridge, for ruptured people, and a Mr. Lee of Arundel Street was appointed surgeon. This gentleman is said to have been successful in curing men belonging to the army and navy, after they had been invalided and sent to Chelsea and Greenwich Hospitals. These men were returned fit for the service. One was 74 years old, and had been ruptured for ten years. I can find no trace of the treatment adopted by this gentleman; but it is possible that it may have proceeded on the same principles."—*Lizars in Edin. Med. and Surg. Jour. No. 72.*

Treatment of the Barcelona Fever.

DR. FRANÇAIS has read to the Academy of Medicine a memoir on this subject. Blood-letting, which has been frequently employed and regarded as highly useful in America, has always proved deleterious in Spain. The tonic and revulsive treatment has succeeded best, particularly the exhibition of cinchona, and the application of the moxa along the spinal column. It may readily be supposed that the means of employing these universally did not exist, but, according to Dr. Français, the trials made were sufficient to demonstrate the happy effects resulting from this plan.—*Lond. Med. and Phys. Jour. No. 284.*

Experiments on Incubation.

M. GEOFFROY SAINT-HILAIRE has communicated to the Institute of France an interesting account of different methods by which *oviparous* animals may be rendered *viviparous*. These experiments completely succeeded with regard to water-snakes (*couleuvres aquatiques*), when placed in a dry situation, and under circumstances unfavourable for dropping their eggs. These were retained by the parent, and preserved in the genital receptacle; so that at the end of a certain period of this uterine incubation, the young came forth from the eggs and the body of their mother. These experiments were not followed with equally successful results in those animals whose eggs have calcareous shells. Notwithstanding his endeavours, M. Geoffroy has not succeeded in effecting the production of young chickens alive; but he is led, from his observations, to believe that this might be done by better contrived means.—*Ibid.*

Frontal Neuralgia cured by the use of Arsenious acid.

DR. LALAURIE, Physician to the Central House of Correction, at Eysson, has published the history of a case of neuralgia, which originated in a puncture of a ramification of the frontal nerve; the disease had continued for a period of ten years, notwithstanding the use of several remedies. From the periodical nature of the disease, M. Lalaurie was induced to employ the arsenious acid, and with complete success. The patient was ordered to take, in the morning, the sixteenth part of a pilular mass, composed of a drachm of white soap, and a grain of arsenious acid; drinking immediately afterwards three cups of water, containing mucilage and honey. This was repeated, every other day, for a fortnight, with complete success. A somewhat remarkable symptom in this case was, that his sight was much weakened; and, about sunrise and towards evening, the symptoms were so much aggravated, as to give rise to a sort of amaurosis, but which became gradually less towards the middle of the day. This affection of the sight, which M. Lalaurie considers to demonstrate the sympathy which exists between the ophthalmic nerve of Willis and the optic nerve, was observed at an early period, by medical writers, to follow supra-orbital wounds; as is exemplified by the following passage in the *Coact. Pranot.* of Hippocrates:—"At vulneribus, quæ in supercilium, aut paulò altius inferuntur, visus acies obtunditur, et quò vulnus recentius est eò magis vident. Inveterascente autem, aut tardente cicatrice magis obtundi solet."—*Journal Complémentaire du Dictionnaire des Sciences Médicales, Juin, 1822.*

On the Medical use of the Sulphate of Quinine.

M. DOUBLE, who gave the first account of the effects of the sulphate of quinine upon the animal economy, has published some observations upon its efficacy in several diseases, which were read at the Institute, and very favourably commented upon by M. Dumeril, who, with M. Portal, was charged with the duty of making a report upon them.

The cases in which he has employed it have been those where the cinchona was indicated; and in several which he has narrated, the sulphate of quinine has been retained upon the stomach, and been productive of the happiest results, when the cinchona in substance would, in all probability, have been attended with considerable inconvenience. The extract or decoction, it is true, might have been substituted; but their mode of preparation detracts so considerably from the activity of the substance which forms their basis, that their administration is attended with comparatively unimportant results. In cases of *remittent fever*, M. Double has given this medicine with the greatest success.

“The rapidity of the diminution of the febrile state, the promptitude with which the exacerbations diminished, and disappeared under the influence of the *quinine*, are worthy of remark; and what is still more worthy of observation, the symptoms of general or local nervous irritation, such as the *meteorismus*, oppression, difficulty of breathing, black state of the tongue, gums, and lips, the delirium, &c. which always accompany, more or less, these morbid affections, diminished in intensity, in proportion as the employment of the remedy was continued.”

Three cases of irregular remittent fevers are given, in which very evident success was obtained from the *sulphate of quinine*, in the dose of from four to twelve grains per day. In one of the cases the administration of the medicine having been accidentally suspended, the disease continued its progress, whilst a diminution of the attacks was obtained from the regular exhibition of the salt. A similar occurrence is mentioned by one of the reporters of the Institute to have occurred in a case of puerperal fever under his care, which was cured by the same means.

In consequence of some observations made by M. Double at a sitting of the *Academie Royale de Medecine*, on the 29th of September last, respecting the probable benefits likely to result from the employment of the *sulphate of quinine* in cases of *yellow fever*, the academy transmitted to its honourable commissioners at Barcelona M. Double's reflections, along with a great quantity of *quinine*. These gentlemen administered it in several cases with great success.

Two cases of *rheumatic neuralgia* are related by M. Double, which were considerably relieved by the use of the same agent: he recommends it to be exhibited in the intervals between the acute paroxysms of this species of affection.

In consequence of several scattered cases preserved in the *Annals of Science*, in which the cinchona was recommended as a means of the greatest efficacy in the cure of hooping-cough, as well as from the periodical nature of the disease, M. Double was induced to administer it in this affection. It was given to the extent of half a grain to two grains, but without the least advantage being obtained from it; on the contrary, it was frequently necessary to discontinue its use promptly, in consequence of the different inconveniences to which it gave rise; the cough augmenting under its exhibition, and the symptoms of nervous irritation being considerably increased. M. Double farther remarks that, in his opinion, hooping-cough is a disease which ought not to be much interfered with by the physician. He observes that he has attacked it again and again, and in various conditions, by different emetics, by the application of leeches to the epigastrium, by irritating frictions, by narcotic liniments upon the pit of the stomach, and by anodines and narcotics, and by *morphine* internally; but whatever may have been the method employed, he has derived no advantage from it: he recommends that slightly antispasmodic drinks and ass's milk should be the only means made use of.

In *scrofulous* affections of every age and of every organ, M. Double has advantageously employed the *sulphate of quinine*: he considers its efficacy to be considerably strengthened by a combination with the *protochloruret of mercury*: he directs a grain of calomel and a grain of the sulphate to be mixed together,

and exhibited every morning to children, and to be repeated three times a day to adults: its use should be persisted in for a considerable time.

M. Double terminates his observations by a very singular case of nervous disease. In the midst of this discourse, the subject of the affection was suddenly seized with a sort of drowsiness; he left off speaking, his eyes closed, the head fell forward upon the chest, and the respiration became nasal and hurried; the pulse was scarcely affected. This state was only of a few seconds duration, at the end of which time he continued to speak as if nothing had happened to him, and without any consciousness or recollection of the attack. These paroxysms sometimes recurred forty or fifty times a day. M. Double employed the *sulphate of quinine* in this case of disease. The dose was carried to twenty-four grains per day, without the patient's experiencing any unpleasant effect from it: a slight amelioration only was, however, obtained; at this time he experienced three or four attacks in the twenty-four hours.

The sulphate of quinine appears to have an action analogous to that of the cinchona, and has, as yet, been only employed in those cases where the cinchona was indicated.—*Revue Médicale, Mars, 1822.*

Of Apoplexies of the Cerebellum. By M. B. A. SERRES.

Case 2. Thomas Marie-Anne, labourer, aged fifty-five years, of a sanguine temperament, strong, and much addicted to venery, passed a part of the day of the 19th of April, 1818, in a pot-house. During the night he was attacked with somnolence, stupor, momentary agitations, and loss of consciousness: he returned no answer to the questions which were put to him; he had erection during a part of the night.

He was brought to the Hospital on the morning of the 20th of April, and presented the following symptoms:—Face red and tumefied; slight stupor, from which he might be roused; respiration short, and sighing at intervals; inspirations thirteen or fourteen per minute; pulse 80, full, strong, and frequent; hemiplegia of the left side of the body, principally of the leg; spasmodic agitations of the right side. He was bled from the right jugular vein, a purgative glyster was administered, and barley-water and infusion of arnica ordered for drink, with an antispasmodic potion. On his return to consciousness, after the bleeding, he appeared surprised to find himself in the Hospital; in the evening a very strong paroxysm; the face much injected, swollen; heat of the neck very considerable; respiration slow; inspirations eleven or twelve per minute; pulse hard, and more frequent than in the morning, 85, 91, and 94 per minute; profound somnolence; insensibility to all kinds of excitement; very violent satyriasis; tumefaction and redness of the scrotum; immobility of the left side; a convulsive movement of the right; abundant emission at the end of the paroxysm; bleeding and sinapisms to the legs were made use of: after the bleeding he remained in the same state; rattling in the throat during the night. On the morning of the 21st—face livid, swollen; lips and nose cold; respiration very slow and short; pulse small, irregular, and very frequent; distention of the mouth; tumefaction and lively redness of the genital organs; abundant emissions;—at nine o'clock he died.

Sectio Cadaveris.—On raising the skull-cap, a quantity of black blood escaped. All the sinuses of the dura matter, as well as the confluence of the sinus, were filled with black coagula; the vessels of the pia mater were distended through their whole extent; the substance of the brain showed no particular appearance; but the cerebellum was redder than in its natural state. When a portion of the superior vermicular appendix was cut into, the action of the air quickly communicated to it a lively red colour; the whole of the white substance of this part had changed its colour, and appeared as if it had been macerated in blood. When plunged into water,

it lost its colour, but never returned to its natural appearance. Some parts of the interior of the *processes* appeared corroded; but there was no distinct *foyer*. The process was divided from before backwards; we found thick black blood enclosed in the fourth ventricle. This liquid had penetrated forwards into the fissure of Sylvius, and backwards into the calamus scriptorius.

On plunging the cerebellum into water, we observed that this blood proceeded from a *foyer* situated in the central part of the right hemisphere of the cerebellum; its breadth, transversely, was two *centimètres* and one *millimètre* (in. .82679); from before to behind, one *centimètre* and three *millimètres* (in. .51182); and its depth might be one *centimètre* and three or four *millimètres* (in. .51182 or .55119): with unequal fringed edges especially at the external side; it occupied the centre of the grey mass, which is met with in the middle of the hemisphere of the cerebellum; all the white substance was more injected in proportion as it approached the edges of the *foyer*; the coloration formed species of concentric sores round the *foyer*; the *tuberculum annulare*, towards the origin of the fifth pair of nerves, was inflamed, as well as the *corpus olivarium*, and the commencement of the spinal marrow; the lungs were gorged with blood, as well as the right cavities of the heart, and the ascendent and descendent *venæ cavæ*; these organs presented no other organic derangement; the intestinal canal showed nothing particular.

Two other analogous cases are related; the one by M. Mance, *ex-eleve interne* of the second class at La Pitié, &c.; the other by M. Dubois, *eleve interne* of the first class of the same Hospital. In both cases, from the affection of the genital parts, accompanied with the other symptoms, M. Serres announced some lesion of the cerebellum, which prediction was confirmed by dissection.

In the Number of the *Journal de Physiologie* for August last, M. Serres has published a continuation of his Memoir upon the organic Diseases of the Cerebellum, in which a case is detailed by Dr. Falret, where the organic disease of the cerebellum (discovered on dissection) was accompanied with considerable irritation of the genital organs, by constant erection of the penis, and frequent emissions. A similar case is also given by M. Serres himself. An exception to the universality of these symptoms in apoplexies of the cerebellum is detailed, but which M. Serres is disposed to think might have had its origin in the morbid process being deeply seated in the substance of the cerebellum, without the superficial parts showing much appearance of previous inflammatory action.

When *apoplexia cerebelli* occurs in the female, M. Serres supposes that the diagnostic marks may perhaps be pointed out by clitorismus, or a tendency to nymphomania. One case, only, in confirmation of this opinion, is adduced by M. Serres.

Marie-Jeanne-Joséphine Dubourg, aged thirty-three years, mantuamaker, was addicted, at an early age, to venereal excesses: the catamenia did not appear until the age of twenty, although she had been accustomed, in a house of bad repute, to excessive venery. Until the age of thirty, according to her own account, she had been fatigued, but never satiated, with venereal pleasures; and notwithstanding the efforts of her relations for the purpose of withdrawing her from the scandalous life which she led, she was, as she observed, irresistibly impelled towards it. This state continued until the age of twenty-nine; at that period, cohabitation with man not being able to satisfy her desires, she gave way to excessive masturbation, and fell into a constant stupor, owing to these excesses, a stupor which was attributed to spirituous liquors, to the abuse of which she was equally addicted.

Ashamed of this state, she submitted to a violent mode of treatment. The clitoris was burnt, under the hope of putting an end to this venereal mania, which was regarded as the cause of phthisis pulmonalis, under which she laboured. She was discharged from the *Hôtel-Dieu*, without having experienced the relief which she expected, and resumed her former habits. She experienced, moreover, very violent headaches, and became suddenly imbecile at the age of thirty-two. She died of phthisis pulmonalis at *La Pitié*, where she had entered for the purpose of being admitted at the *Hospice de la Salpêtrière*.

Necrotomy.—On dissection we discovered an induration of the superior and inferior vermiform process; in some places there were small ulcerations, each capable of containing a common issue-pea; the edges were hard, yellowish, and the bottoms lined with a thick membrane; the cavity contained a yellowish serum; the whole of the cerebellum before the superior vermiform process was softened, and of a yellowish white colour; the substance of the cerebellum resembled that of the fœtus of the second month, or of the commencement of the third. The cerebellum surrounding the vermiform processes was inflamed, and harder than common. The arteries of the cerebellum were more than usually developed. The body was injected in order to examine these last arteries; and my attention was also directed to those of the pelvis, where all the divisions of the hypogastric artery were found increased in size; the uterine, the vaginal, the vesical, and the hemorrhoidal, were prodigiously dilated. Did there exist any connection between these developments of the arteries of the pelvis and the nymphomania? I am of opinion that there did, and I found this assertion upon anatomical inspection of these same arteries in phthisical patients. Every one knows that these subjects are excessively inclined for coition and masturbation. In about sixty dissections, which I have made with this intention, I have constantly found the divisions of the hypogastric artery much augmented in *calibre*. Whether this dilatation of the arterial system is an effect or cause, it is important to know. I have also examined the cerebellum, but have found nothing remarkable, either in volume or weight.

M. Serres concludes his observations by the detail of two ordinary cases of apoplexy occurring in the female, and where the morbid alteration was found, on dissection, to be seated in the cerebellum.—*Journal de Physiologie, &c. par F. MAGENDIE, Août, 1822.*

Extract of a letter from Dr. G. Van dem Busch, to Dr. Eberle, dated Bremen, September 4th, 1822.

“PROFESSOR Gräfe, of Berlin, has recently passed a ligature round the *arteria innominata*, in a case of aneurism of the subclavian. He regrets that he was not better acquainted with Dr. Mott’s operation of the same kind, having no other knowledge of it than could be obtained from a very short and imperfect notice of it published in some of the German journals. He states that he would have followed Dr. Mott’s mode of operating had he been sufficiently acquainted with it. Professor Gräfe operated on the 5th of March 1822, in the presence of a great number of Physicians and Surgeons. Finding that the subclavian was too much diseased to admit its being taken up, he passed his ligature round the *innominata*, and tied it about an inch from the arch of the aorta. The patient was immediately relieved of all the symptoms depending on the aneurism, and every thing went on so favourably that his perfect cure was confidently expected by the physicians who visited him. Four or five weeks after the operation, however, considerable hæmorrhage supervened, and rendered the issue of the case, for a time, very doubtful. Dr. Gräfe succeeded finally in putting a check to the bleeding, and on the sixty-first day after the operation, the patient was in a state, which encouraged the hope of his final recovery. When the ultimate event

of the case shall have been ascertained, I will communicate it to you more circumstantially. It is worthy of remark, that both in Dr. Mott's case, and that of Dr. Gräfe the bleeding came on only a considerable time after the operation."

Extract of a letter from Dr. Gerson, of Hamburgh, to Dr. Eberle, dated Hamburgh, June 20th, 1822.

"THERE never was a time in which practical observations were more particularly attended to in Germany than at present. Except with the partizans of animal magnetism, that wild and profitless mode of reasoning upon medical subjects, which was introduced and cherished by the Brunonians, has almost entirely been abandoned. Our most eminent medical men are less forward to come before the public; they see the importance of maturing observations, and verifying them by the test of repeated experience, before they publish them. In France, it is not so. There every body is speculating with great industry on the doctrines of Broussais. Dr. Casper, a very ingenious young physician of Berlin, has lately published an interesting work on the present state of medical science in France, in which he compares Broussais to Brown, and shows that their theoretical way of reasoning is nearly the same, though their practice is so opposite to each other. Certainly, however, the Scotch physician was much superior to the French in point of genius, though the latter is most likely the better practitioner. In Germany the Broussain theory and practice has as yet found very few, if any advocates; though many of our physicians are exceedingly prone, like some of the English, to find inflammation every where.

A topic which has attracted great attention in England—that is, the mercurial antisyphilitic question, has not yet had much attention paid to it in Germany. The whole, nearly, of the medical men of this country are *mercurialists*, although they use that mineral but moderately, and do not go to such length in its employment as appears to be done with many of the English and American physicians.

A surgeon of this city, more noted for his enterprise than his scientific acquirements, has lately twice performed the operation, an instance of which you have published in the Medical Recorder, of opening the abdomen for the purpose of removing a tumour of an unknown nature. He was successful in both operations. In two former operations of this kind, this surgeon could not find any thing to take away, and the patients were sacrificed. Although this operation has within a few years been performed with success in several instances, yet I am of opinion that, according to the rules of good surgery, it should not be undertaken until our diagnosis of the disease be better founded than it can be in the present state of surgical science."

Description of an Apparatus for Removing Poisons from the Stomach, invented by MR. JUKES, Surgeon.

WE might with justice be considered to be forgetful of the duty we owe the profession, were we to fail in laying before them a description of a very excellent apparatus which Mr. Jukes, its very ingenious inventor, favoured us with a sight of. It consists of an elastic gum tube, a quarter of an inch in diameter, and two feet and a half in length, terminating at one extremity in a small globe of ivory, with several perforations; the other extremity is adapted, either by screw or by plug (the latter is preferable), to an elastic bottle of sufficient size to contain at least a quart of liquid, and having a stop-cock fitted to it, in a similar manner as in the hydrocele bottle. Instead of the bottle, a pewter syringe, of an equal capacity, may be adapted, in the same manner, to the flexible tube. The operation by the syringe is performed more quickly, and may therefore, perhaps, be preferred by some. In cases where surgeons have neither bottle nor syringe, the tube alone might be made

to answer the purpose, if the operator apply his mouth to its extremity, and thereby institute the office of a siphon.

Application.—The patient ought to be placed on the left side, and the *globulated* end of the tube be then carefully passed to the greater curvature of the stomach, either through the mouth or nostril, as may be thought proper. Having previously filled the *bottle* or *syringe* with warm water, at the temperature of 150°, screw or plug it to the tube, turn the stop-cock, and gently force the contents into the stomach. The then diluted contents are to be immediately withdrawn by pulling up the piston; or, if the *bottle* be applied, the same effect will ensue from its elasticity enabling it to recover its original form, by which the fluid contents will return, charged with the poison. This operation ought to be repeated, till the water, which is withdrawn, becomes clear and tasteless.

In Mr. Jukes's experiments, first on dogs, and then on himself and others, assisted by Mr. James Scott, Surgeon, in Westminster, the apparatus was proved fully to answer the intended purpose. In these experiments, Mr. Jukes swallowed, first, *two drachms* of laudanum; he afterwards gradually increased the quantity, until it reached ten drachms: since which, he has administered to several individuals (one of them a female) *one ounce* of laudanum, with an equally successful result. The utility of so well contrived an instrument, arising especially from its being equally adapted to the removal of all the more bulky poisons, must be evident to every one. We consider that Mr. Jukes has rendered an essential service to the profession, and to the community, by its invention. *Lond. Med. Repos. October, 1822.*

Presence of Urea in the Blood.

M. Ségalas (with Professor Vanquelin) has lately discovered urea in the blood of dogs which had been deprived of their kidneys; confirming what MM. Prévost and Dumas, of Geneva, had previously announced.—*Bulletin des Sciences par la Société Philomatique, &c. Paris, Juin, 1822.*

Fluids forced on a retrograde motion past the Valve of the Colon.

An intelligent pupil, Mr. Malcolm, discovered, that the valve of the colon may be overcome, and fluid forced in the retrograde direction, by pressing on the abdominal parietes in the right iliac region over the *caput cæcum*. This pressure has the effect of compressing the colon between the anterior muscular parietes and the internal iliac muscle, so as to approximate the commissures of the valve, and thus to open it. Whether it may be so easily overcome in the living state, I have not had an opportunity of ascertaining; but a case of hernia occurred a few days ago, where injections *per anum* passed through the valve into the ileum, and flowed out at a false anus in the left groin. This patient was not *in articulo mortis*, but had considerable strength. *Edin. Med. and Surg. Jour. July, 1822.*

On the use of Belladonna in Diseases of the Eyes. By DR. N. HILL.

I beg leave to enclose the case of a young lady, showing the happy effects obtained by the application of belladonna in some diseases of the eye,—a fact not generally known to the public, but of which charlatans successfully avail themselves. From what I have seen and can learn, the itinerant oculist, Mr. Williams, uses the belladonna indiscriminately. The particular effect to which I allude, is very striking in the case of a young lady, with capsulo-lenticular cataract in both eyes, the consequence of an attack of purulent ophthalmia in infancy. The margin of both lenses is nearly transparent, that of the left eye more so than that of the right, for it is by the left only the form of objects is ascertained, while the right is merely sensible of light. The eyeballs have the quick tremulous motion peculiar to congenital cases of

cataract. By the aid of very convex glasses, and a shaded light, she with great difficulty was taught to read. The books and other objects were carried close to the eyes, as in myopic patients. When a distant object was to be looked at, she was enabled to have some idea of its form by arching her hands over the eyebrows. She has now used the belladonna for eight years, and is disposed to think that it strengthens her sight, and that its powers have rather increased. But this I attribute to her having acquired greater dexterity in the application. She applies the solution of the extract four times a day, at each time dropping two drops from a quill upon the ball of the eye; and its effect commences in half an hour from its application. The tremulous motion, I observe, returns as soon as the influence of the narcotic subsides; and she now depends so much upon it, that she never leaves her bedroom till the pupil is dilated. When I first saw this lady, I applied the belladonna with the view of examining the state of the lens; the effect of which was so powerful, that she was perfectly satisfied, and declined an operation, to which I cheerfully acquiesced. In most instances, narcotics lose their power; nor is the system so susceptible of their effects after repeated use. But, in reference to belladonna, it would seem fortunately to be an exception; but of which, I must confess, I was not formerly aware.—*Ibid.*

Observations on Uterine Vagitus and the respiration of the Fœtus. By Professor OSIANDER.

At the sitting of the Royal Society of Sciences of Gottingen, on the 11th of November, 1820, the Director, Professor Osiander, read a memoir, containing a series of observations on the vagitus, respiration, and vitality of the human fœtus, during and immediately after parturition. He has, in this paper, given the results of his experience on these points for upwards of twenty years. The principal facts are the following:

1. The human fœtus, whether full grown or premature, can breathe and cry when the head has passed the external parts, although it be closely confined from the narrowness of the parts, and whether the delivery has been effected by the natural efforts, by the hand, or by the forceps. The author has confirmed this assertion by twelve cases, for the most part observed in the lying-in hospital.

2. In difficult delivery, effected by the forceps, the child cries at the moment of the passage of the head, although the forceps have not been removed.

3. In nine cases the child breathed and cried as soon as the head was born, although the funis was twisted at least twice round the neck, and in some of the cases very tightly; in four cases the cry was heard and the child seen to breathe immediately after the funis was disengaged.

4. Two children of unusual size, of which one weighed ten pounds, cried as soon as born, although one had been fixed in the pelvis for two hours, from the narrowness of the genitals, and although the anterior fonticelle was perfectly ossified.

5. Two children cried immediately after birth, although the neck was compressed by the arm and hand, the latter having been expelled with the face.

6. Four children, born with the membranes unbroken and transparent, being surrounded by the liquor amnii, were seen to open and shut the mouth as a fish under water.

7. This phenomenon was not observed in another, born under the same circumstances.

8. Two, on the contrary, opened the mouth, breathed, and cried, notwithstanding the face was covered with the empty membranes.

9. One child, born and covered wholly by the membranes, ruptured them and drew them over its face.

10. One child cried as soon as the head was expelled, although its mouth was filled with blood escaping from the mother.

11. *Some children delivered by the feet breathed and cried, although the head was still in the uterus.*

12. In one instance, the waters having escaped, and the pains being very severe, *the child was heard to cry in the uterus so distinctly, that many students present authenticated the fact by their signature in the note-book of the Institution.* The crying was heard under the same circumstances, in his private practice, by Professor Oslander, by the mother, and the standers by.

13. A dropsical child, extracted with much difficulty, gave signs of life.

14. A dead fœtus, affected with anasarca and ascites, according to the mother, moved distinctly before birth.

15. A child died during labour, and was extracted quite dead. Although no air had been inflated, the lungs were found considerably distended, and floated in water, a proof that respiration had been perfectly performed in the uterus before birth.

16. A deformed child, like a dead fœtus, breathed after birth with a sensible noise, and died in a few moments. On dissection no traces of air were found in the lungs, although they were very expansible.

17. A child, prematurely born, had the skin of an orange colour, and the cuticle was detached in many parts; it lived, sucked, and left the institution alive at the same time with the mother.

18. A blind woman was prematurely delivered from the effects of fright. The child breathed freely during delivery, but died in a few moments; the lungs sunk completely in water.

Duct from the Ovary to the Vagina, in the Cow and Sow.

Dr. Gärtner, of Copenhagen, has demonstrated the existence of ducts leading from the ovaries to the uterus in the Cow and the Sow. He has had an honorary medal adjudged to him by the Danish Royal Society. A description, with engravings, of these ducts is speedily to be published.

Some years ago Dr. Dewees, of this city, published a new theory of generation, which is predicated on the existence of such ducts between the vagina and ovaries. The doctor supposes that the semen masculinum is carried directly from the vagina to the ovaries, by means of a species of absorbent vessels, passing from the one to the other of these parts. Should the existence of such vessels be hereafter demonstrated in the human subject, as they appear now to be in the cow and sow, Dr. Dewees's sentiments on this head will be much more plausible than any that have hitherto been published on this subject.

Re-union of the Osseous Disc, separated by the Operation of Trepan.

DR. WALTHER, professor of Medicine and Surgery at Bonn, relates the following experiments, showing the re-union of the osseous disc, after it has been separated by the operation of trepan.

The left parietal of a dog, with a very small portion of the frontal bone, was laid bare by a crucial incision. A small trephine was applied to the parietal bone, close to the sagittal suture. The teeth of the instrument, after perforating the bone, had torn the dura mater, where it forms the ensiform sinus, and had opened the latter. Having removed the disc, the blood escaped with rapidity; but the hemorrhage was quickly stopped by means of lint. During this interval the bone, separated from the cranium and all the soft parts, remained upon the table. The periosteum was also removed from it. Perceiving no hemorrhage to follow the removal of the charpie which had been applied to the wound of the sinus, the osseous disc was replaced in the situation from which it had been taken. It did not entirely fill the hole in the parietal bone. The flaps formed by the scalp were placed over it, and their margins kept in contact by means of a suture.

The animal suffered little during the operation. On the second day he had slight fever, but on the third regained his appetite. The dog lived twelve months afterward. After his death, the portion of bone formerly removed was found to be united to the margin of the opening, so as to render it difficult to discover its limits: so closely did the callus resemble the rest of the osseous substance, that they could not be distinguished.

The following case, which occurred in the human subject, is still more important:

A man was wounded on the head by a stone. The symptoms of concussion were moderate. He was bled on the second day after the accident; and on the sixth he felt himself so far recovered as to pursue his occupation. Pain of the head soon became so violent as to render him incapable of work. He was bled from the arms and feet, had cold lotions and ice to the head, vesicatories and setons to the nape of the neck, with purgatives and emetics, without relief. At length the pains in the head became intense: no other symptom, indicating lesion of the brain, was present. This determined individual begged with impatience for the operation, and refused every other treatment. The operation of trepan was resolved upon, in the situation where the pain was most severe. After making a crucial incision, the trephine was applied, and the osseous disc removed. The dura mater, and the internal surface of the vitreous table, were sound; nor did exudation exist between the two lamellæ of the bone. The periosteum, which was in part detached from the disc, was now entirely removed. The portion of bone was replaced into the opening, and the scalp over it retained in contact by means of adhesive plaster.

The febrile symptoms were moderate; the inflammation of the dura mater was by no means severe, and entirely local: but re-union of the flaps did not take place. Suppuration supervened. The discharge continued during some months; yet the patient found himself better, and the pain of the head gradually diminished, and ultimately disappeared. At the bottom of the wound, the osseous disc could be felt with the probe, free and moveable. The operator conceived, at the end of the third month, that it ought to be removed; but, after having seized it with the forceps, instead of bringing away the piece of bone in its entire thickness, a very thin, angular and ragged portion, containing only a part of the external table, was removed. The inferior surface of this portion was rough and unequal: one of its margins was round, the other pointed and serrated. In a word, the vitreous table of the separated disc and a part of the external lamella were re-united; while the larger portion of the latter was exfoliated. On attentive examination of the bottom of the wound by the probe, the parietal opening was found thoroughly closed, and filled by osseous matter, hard, and covered by healthy granulations.

As exfoliation and granulation cannot take place unless from a part which possesses an active state of its vessels, so it becomes evident that the re-united portion of bone retained its vitality in this case, formed vascular connections with the dura mater and with the diploë, and became subject to the usual processes of nutrition and vascular action.

After the removal of the exfoliation, the suppuration gradually diminished, and in a short time the wound cicatrized in the usual manner.—*Nouveau Journal de Medecine.*

In the third volume of the American Medical Recorder, in a paper entitled "Observations on certain articles of the American Materia Medica," by Stephen Burson, M. D. &c. The name should be Stephen Burson, M. D. &c. As the paper has been quoted by Dr. Bigelow in his Medical Botany, and by Dr. Eberle in his Materia Medica and Therapeutics, I wish the error corrected.

STEPHEN BURSON, M. D.

January 2d, 1823.

LITERARY INTELLIGENCE.

TO THE PHYSICIANS OF THE WESTERN COUNTRY.

BEING engaged in composing a Treatise on the Diseases of the Western Country, the undersigned begs leave respectfully to solicit the assistance of his medical brethren. The plan of his work will admit of a notice of every disease that may have been observed to occur in this interior region; but he does not propose to give extended histories of those forms which are common to it and other portions of the United States. His attention will be particularly turned to the modifications and varieties that may have been produced by the soil, climate, diet, and drinks, occupations and pursuits, to which the people of these states are subjected, or in which they may be engaged. Such facts, therefore, as relate to the influence of these, or any other class of remote causes, coming especially within the scope of his work, will be thankfully received. Among the numerous objects to which his attention is directed, he will name the following, as those on which he is particularly desirous of collecting information.

1. Our Summer Endemics—Cholera Vulgaris, Cholera Infantum, Dysentery and Diarrhœa. Of their connection with heat, humidity, local situation and diet;—their relative prevalence in town and country, and in high and low situations. Of their occurrence at other seasons than summer, and the modification which they then exhibit. Of their union and alternation in the same subject, and their conversion into other diseases, especially of the change of Cholera Infantum into Hydrocephalus.

2. Our Autumnal Fevers—Remitting and Intermitting. Of the times of their appearance and disappearance in successive years. The modifications of type which they exhibit, and their relative mortality in different autumns. Whether they ever put on the characteristic symptoms of the Yellow Fever of the maritime cities. Whether they have become more malignant in towns situated on our great rivers, since the introduction of steam-boats. Are they, under any circumstances, contagious? Whether there are any important differences between those which infest the mouths of the rivers which empty into Lake Erie, and those which occur about the confluence of the streams, which form the Mississippi. Of their treatment, with particular observations on blood-letting, antimony, mercury, the bark, and water—cold, warm and tepid—as an external application.

3. Our Typhous Fevers. Whether from the times of their occurrence they might with propriety be called winter epidemics. Whether the description given of Typhus Mitior, by the English physicians, is applicable to it in this country. Whether it is ever contagious. To what extent it is induced by the employment of blood-letting in the autumnal fever. Whether it generally seems to destroy life by invading the brain. Facts and conjectures relative to the causes of typhous atmospheric constitutions. Of the modifications produced in other fevers and the phlegmasiæ, by such constitutions. Of the treatment of Typhous Fevers—especially of the antimonial preparations, mercurials and cold water.

4. Of Puerperal Fever. Whether it has at any time been epidemic in the western country; and whether it inclines more to a synocha or typhous type.

5. Of Scarlatina Anginosa, and Angina Maligna—in what way connected. Facts relative to their prevalence in 1792 or 3, and about the year 1810. The treatment, and especially of cold water. Of Measles—how far the antiphlogistic treatment, proper in this malady, is at any time to be modified from the

prevalence of a typhous atmospheric constitution.—What is the nature and proper treatment of the disease attending the retrocession of this eruption. Whether it ever happens in the remote settlements, independently of contagion. Of the Small-pox and Cow-pox—Whether the former still continues to prevail in any part of the Western country; and what are the obstacles to the general adoption of the latter. Whether Urticaria should be considered an idiopathic affection, or is always symptomatic of a disorder in the stomach.

6. Of Phlegmasiæ of the lungs, trachea and fauces. Of their modification by a typhous atmospheric constitution. Whether the Pneumonia Typhodes ever prevailed in these states before the year 1812 or 13. Whether it did not chiefly occur in the country. In what respect it resembled the Spotted Fever of New England. Whether stimulants and tonics were not injurious in the treatment of it; and whether gastric and alvine evacuations were not more safe and proper than sanguineous.

Of the relative prevalence of Croup in different seasons of the year. Of its connection, in June and July, with Cholera Infantum. How far blood-letting is proper in its treatment.

Of the atmospheric changes which most uniformly produce Catarrh. Of the difference between a prevailing Catarrh from such changes, and the Influenza. Whether the latter is contagious. Of the different periods when it has been epidemic in the Western Country, and especially of its prevalence in 1807. Of its geographical progress and successive appearance at different places. Whether it has been observed to be the precursor of more malignant epidemics. Whether in many instances it has been observed to produce Phthisis Pulmonalis.

7. Of Pulmonary Consumption. Whether idiopathic Consumption is not a rare disease in the Western Country. Whether the greater number of cases which receive this name are not *sequelæ* of Dyspepsia, Catarrh or Hepatitis. To what cause the infrequency of true phthisis should be ascribed. Whether any remedy for it has been found. Are there any proofs that an emigration from the seaboard to the West has cured this disease? Have not the persons who have been cured by mercury been affected with dyspeptic consumption? Is not the chronic inflammation of the mucous membrane of the fauces with an elongation of the uvula which sometimes accompanies this disease, the effect of the pulmonary disorder?

8. Of Rheumatism. Its relative frequency among different classes. Its translation to internal organs. Of the means of cure—blood-letting, antimony, mercury, stramonium, the bark, percussion and bandages. Whether Gout is not a rare disease in the West.

9. Whether Ophthalmia does not appear as an autumnal epidemic, especially in the newer settlements. Whether it does not sometimes assume an intermitting form, and very commonly require general remedies. Is it ever contagious?

10. Of Jaundice and Hepatitis. Whether the former ever occurs as an epidemic? Is the bark of the wild cherry tree (*Prunus Virginiana*) of greater efficacy in this disease than the other vegetable bitters? If so, is it owing to the presence of prussic acid? Is chronic hepatitis, when not the offspring of intemperance nor autumnal fever, produced by the heat of our climate, or by miasmata?

11. Of Dyspepsia. Whether it be more prevalent in the Western or the Eastern States. Whether tobacco, tea, coffee, whiskey and hot unfermented bread, used to excess, are not its most efficient remote causes. How far the climate is concerned in its production. Of the nature of the acid in dyspeptic stomachs, and whether it be the effect of fermentation or morbid secretion. Of the diseases in the animal functions that are observed to arise from dyspepsia. Whether this disease generally abates about the 34th year. Of the cure. Of the relative prevalence of Sick Headach in the Eastern and Western States. Of its cure by emigration from one to the other.

12. Of the premature decay of Teeth. How far it arises from climate, negligence, or indigestion. Is the use of tobacco in any degree a preventive?

13. Of Calculous Disorders. Whether they arise from the use of the calcareous waters which are generally drunk in the Western Country.

14. Of Chronic diseases of the Skin. Whether it be true that some varieties of Psora are peculiar to the West.

15. Whether Tetanus ever appears as an idiopathic disease. Does it as frequently supervene upon wounds in the Western Country as in other places?

16. Of the relative prevalence of Hydrophobia, Mania, Palsy, and Apoplexy in the West and East.

17. Of the rare occurrence of Scurvy, Rickets and Goitre.

18. Of the diseases attendant on or following the earthquakes of 1811—of those occurring at the lead mines and at the salines or salt works.

19. Of the diseases produced by the bite of the rattle-snake, copper-head, and other venomous serpents. Their symptoms, pathology and cure.

20. Of the disease called "SICK STOMACH" and "MILK SICKNESS." Its symptoms, and the seasons and situations in which it prevails. Of its remote causes—miasma, milk and flesh of herbivorous animals eaten by man, water with poisonous impregnation. *Post mortem* examinations. Cure.

21. Of the appearance and disappearance of diseases from clearing and cultivation—the introduction of new arts and occupations—the adoption of new modes of living.

22. Of the morbid effects of premature marriages.

23. Of the prolongation of life by an emigration to the Western States.

24. Of Bills of Mortality.

25. Of diseases of the Indians, especially those introduced by their intercourse with the whites. Of the causes of their decay in numbers.

26. Of diseases of the Negroes. How far they are liable to the ordinary complaints of the whites. Of the prevalence of Scrofula among them.

27. Of Epizootic medicine, or the diseases of brute animals, in the West. Of the symptoms, causes and cure of the complaint which in cattle is compared to the "Sick Stomach" in man. Of the disorder produced by eating the leaves and nuts of the fœtid buckeye (*Æsculus Ohioensis*, of the younger Michaux). Of the autumnal salivation of horses.

28. An account of the soil and climate at each spot where observations on any of the above topics may be made.

The subscriber is not so unreasonable as to ask or expect replies to the whole of these queries from any individual. He flatters himself, however, that from among the numerous practitioners of the Western States and Territories, he may be favoured with information not only on the subjects here designated, but on every other involved in a comparison between the diseases of the Western Country and other parts of the world. To such as may be able and willing to promote the object in view, by entrusting him with the results of their experience, he engages to do full and equal justice in the quotations he may have occasion to make. Communications made at any period before the end of the year 1823, will be in time to answer the purposes intended.

DANIEL DRAKE, M. D.

Cincinnati, Ohio, September 1st, 1822.

New Air-Pump.

WE have seen the drawing of a new air-pump invented by Dr. Jacob Green, lecturer on chemistry in this city, which appears to us to be superior to any apparatus of the kind hitherto constructed. We understand that the drawing is in the hands of an able artist of this city, who is engaged in constructing an apparatus after its plan.

TO THE PUBLIC.

Baltimore, Dec. 30th, 1822.

A NUMBER of professional and other gentlemen in this city, impelled by a similarity of views, taste and wishes, in relation to certain branches of knowledge, have lately formed an association, under the name of *The Maryland Academy of Science and Literature*.

In announcing the existence of this association, its members are influenced by no ostentatious motives. Their only object is, by making known the intrinsic importance, and eventual utility of the pursuits embraced in their scheme, to obtain, for purposes of general benefit, the co-operation of a numerous and intelligent community.

The Academy under view is divided into two classes, the one of *Science*, more particularly *Natural History*,—and the other of *General Literature*, or *Belles Lettres*.

By the class of Science, much has already been effected. To the active zeal and spontaneous liberality of some of its members, and of other gentlemen, the Academy is, at this early stage of its existence, indebted for an extensive collection of mineral substances from all parts of the Globe, and for an Herbarium containing several hundred native plants. It has, moreover, the prospect of forming a Geological Cabinet of considerable interest; in short, it rises upon a basis exhibiting, if not sudden brilliancy, at least, a very flattering promise of progressive usefulness, and future stability.

It is evident, however, that the individual exertions of the members composing the class of Science, cannot embrace the whole range of research, observation, and discovery, which a field so immense as the Natural History of Maryland opens before them. Engaged like other citizens, in busy and multifarious occupations, their labours for the advancement of natural knowledge must necessarily be limited to the productions and phenomena which the immediate vicinity of Baltimore may present. Hence, in their anxiety to enlarge their cabinet, they earnestly request the aid of their countrymen in collecting, preserving, and forwarding to the Academy, any object calculated to illustrate the natural history of the STATE. They likewise request the communication of any interesting facts, connected with Geology, Mineralogy, Botany and Zoology; for natural as well as political history is essentially composed of facts, with this difference, that the facts of the former possess a permanent, and those of the latter only an evanescent interest.

To gentlemen of the learned professions throughout the state, the present appeal is more confidently addressed. They can readily appreciate the objects of the Academy, and they will, no doubt, deeply participate in the gratifications arising from enlarged views of the works of nature—of the structure and compositions of our globe—of the rich and diversified productions spread over its surface, and of the mighty revolutions which it has undergone. From this globe, countless generations of men have been swept away by the hand of time; stupendous fabrics, once the proud results of human skill and labour, have either totally disappeared, or left only a few melancholy ruins; but the wonders of the natural world still remain in their original majesty—physical monuments still exist in their primitive grandeur and sublimity, to attest the awful conflicts of nature and the elements. They offer, as it were, venerable inscriptions, traced by the hand of the Creator himself, and legible to every observing eye. To record and elucidate these grand phenomena, and facts connected with them, is, in a peculiar manner, the desire of the Academy. In this, they are stimulated and encouraged by the example and success of many European, and of some American geologists. Of late, the geological science has made an astonishing progress, leaving, however, several links in the immense chain of facts and observations, yet to be sup-

plied. These facts and observations must evidently be derived from various sources. The Academy presents a focus where the rays of geological light, now beaming here and there through the state, may be made usefully to converge.

Captains and officers of vessels, and other gentlemen visiting distant countries, likewise have it in their power greatly to assist the collateral objects of the Academy, by their attention in procuring the rarest and most curious productions of nature peculiar to those countries, and by their politeness in forwarding the same. The ocean, the seas, and the waters in general, are comparatively but little known. Their rich and diversified productions may be said still to present a new field of research and discovery to the votaries of natural knowledge.

Let it be distinctly understood, that the objects of the Class of Science in this Academy, are not merely speculative and theoretical. If, on the one hand, natural history opens enchanting vistas, and affords ceaseless delight of the purest kind, on the other, it has in prospect abundant mines of discovery intimately linked with the interests and prosperity of agriculture, the mechanical arts, manufactures and commerce. At present, we can scarcely be said to know one-half of the valuable treasures with which the bounteous hand of the Creator has enriched our country, but to the discovery and improvement of which he has annexed the exciting conditions of enterprise, research, experiment, and labour. The members of the Academy do not intend solely to contemplate nature with the poet's or painter's eye. They aim at being practical naturalists. Chemical analysis will make them better acquainted with the composition and properties of the various soils in the state of Maryland. Their task will principally be to ascertain and point out the existence of substances useful to the farmer, mechanic, manufacturer, physician, &c. They do not advert to the very slight chances of discovering gold or silver; but is it unreasonable to expect that in this state, there are yet unknown, and of no advantage either to their owners or to the community at large, rich ores of iron, copper, or antimony—valuable clays of various compositions; healing, esculent or otherwise serviceable plants, beds of fertilizing earths, marl, &c.—springs impregnated with mineral substances, or medicinal salts? For the investigation and analysis of such objects, the members of the class of Science tender their services to their fellow citizens, only claiming in return, donations of such natural productions and curiosities as have already been alluded to, not for their exclusive use, but for the general benefit, it being their intention to make their cabinet accessible to all zealous and active votaries of natural knowledge, without any charge or expense whatever.

It is deemed unnecessary to develop the objects of the class of Literature. The bare mention of its existence, will, it is hoped, be sufficient to induce literary gentlemen to join it, and thus to promote the contemplated union of pursuits, which, if not necessarily allied, are, at least, calculated to aid and adorn each other.

To conclude, the members of *The Maryland Academy of Science and Literature* have entered upon their scheme of association, and now proceed in the execution of the same, with a strong conviction that, if earnestly assisted by their fellow citizens, in the way stated above, it may be ultimately attended with the happiest effects. They look not so much to their own gratification in the pursuit of favourite objects, as to the benefit of the community at large. Their association may, at least, produce two very beneficial results. It may excite, in many parts of the state, a spirit of profitable inquiry—and concentrate that intellectual strength, which is now partly inefficient because divided. If, according to the remark of the celebrated Bacon, *knowledge is power*, it is chiefly when confederated for useful ends.

Confidently relying on the good will and aid of their fellow citizens, the

members of the Academy have appointed to receive such minerals, plants, or other objects as may be forwarded, the following gentlemen :

Mr. L. H. GIRARDIN, *President*,
Baltimore College, Mulberry st.
Mr. J. F. DUCATEL,
No. 26, Market street,
Dr. JAMES H. M'CULLOH, } *Curators.*
At the Custom House.

By order of the Academy,
P. MACAULAY, Sec'ry.

PHILADELPHIA VACCINE INSTITUTION.

The subscriber, who, for several years past, has been entrusted with the vaccination of the poor under an ordinance of the City Councils, and to whom numerous applications have consequently been made for furnishing Vaccine matter, has heretofore gratuitously distributed it, at a considerable expense of time, labour, and trouble, to practitioners of Medicine, in this as well as other states of the Union. Under that ordinance it is his duty to supply the practitioners of the city ; but in consequence of the increased demands from every section of the country, and with a view to accommodate with certainty the physicians of the United States, he has determined, by the advice of many of his medical friends, to open an office for the distribution of *Genuine Vaccine Virus*.

JOSEPH G. NANCREDE, M. D.

Vaccine Physician, under an Ordinance of the Select and Common Councils of the City of Philadelphia, No. 151, S. Tenth-street.

We entirely approve of the above plan for the distribution of Vaccine Matter, and do believe that the duties which it imposes will be performed by Dr. Nancrede with care and fidelity.

Philip S. Physick,
N. Chapman,
Thomas C. James,
W. Gibson,

John A. Monges,
Joseph Hartshorne,
Thomas T. Hewson,
John Redman Coxe.

N. B. Applications, by letter, post paid, enclosing three dollars, will at all times receive immediate attention.

Philadelphia, May 10th.

PREPARING FOR THE PRESS,

A Treatise on the Diseases of the Eye. By George Frick, M. D. of Baltimore ; in one volume, 8vo.

Dr. Joseph G. Nancrede has undertaken to prepare for publication, an abridged translation of Broussais' "*Histoire des Phlegmasies, ou Inflammations Chroniques*." We are glad that Dr. Nancrede has undertaken this task. He is well qualified, in every respect, to do justice to it.

Dr. J. Bell, of this city, proposes to publish a treatise on Nautical Medicine. A good work on this subject is much wanted.

Dr. Lobstein, of this city, has in press, and will publish in a few days, a small work, entitled, "*Directions for the Examination of the Sick.*" We have seen the manuscript, and consider it a very useful manual for young practitioners.

CIRCULAR NOTICE

To Students of Medicine and those who may be disposed to engage in the study of Medical Science.

Dr. Wiesenthal proposes to open his office in Chester Town, Kent county, Maryland, for a course of medical instruction to such gentlemen as may be disposed to engage in the study, in order to prepare themselves for attending the Lectures in the University, and for graduation.

Lectures will be delivered on Pathological and Operative Surgery, Practice of Physic, Materia Medica, and Obstetrics; and whenever opportunity affords, Anatomical Demonstrations will be given, and an examination of each student once a week during the course.

Dr. W's Medical Library is very full and complete, and additions will constantly be made of all modern publications of merit, together with the approved medical periodical works.

The duration of the course will be from one to four years, as may suit the disposition of the student; the fee for admittance will be 100 dollars for the first year, and 30 dollars per annum afterwards.

Should any student desire to study Mineralogy, he will have the benefit of a good collection of mineral specimens.